UNITED STATES DISTRICT COURT
EASTERN DISTRICT OF MICHIGAN

DAVID CLARK,

Plaintiff,

v.

FORD MOTOR COMPANY, a Delaware corporation.

Defendant.

Cause No. _____

PLAINTIFF'S ORIGINAL COMPLAINT

JURY TRIAL DEMANDED

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Plaintiff David A. Clark hereby files Plaintiff's Original Complaint against Defendant Ford Motor Company. This lawsuit is based upon the investigation of counsel, the review of scientific and automotive industry papers, and the investigation of experts with relevant education and experience. In support thereof, Plaintiff states as follows:

I. INTRODUCTION

1. Ford Motor Company ("Ford") has designed, manufactured, distributed, and sold hundreds of thousands of 2011-present model year Ford diesel trucks equipped with 6.7L Power Stroke diesel engines (the "Affected Vehicles") which contain defective high-pressure fuel injection pumps (the "CP4 pump") supplied by automotive component parts supplier Robert Bosch GmbH ("Bosch"). Ford has concealed from consumers the crucial fact that the CP4 pump has a fragile and unstable design, which causes metal parts to rub against each other on the first day of operation and through the life of the vehicle. This friction generates metal shavings that contaminate the fuel system, which inevitably will cause component wear, and can lead to catastrophic engine failure. Ford never disclosed this critical defect to Plaintiff or any consumers at the point of sale or in any other communication.

2. The design of the CP4 pump is fundamentally flawed in several respects. While cheap and simple, the pump is—as others have described it—a

ticking "time bomb."[1] As Ford knew, the CP4 pump's fragile design—which generates metal shavings in the fuel system regardless of fuel quality—is particularly incompatible with U.S. diesel fuel, which is "dry" and not lubricious. The CP4 pump uses the fuel itself for lubrication, and the design of the pump requires a cam and two pumping cylinders with individual rollers to seamlessly roll together without skipping, sliding, sticking, or wearing to operate effectively. Since standard U.S. diesel fuel is not lubricious, the wear on the cam and rollers is accelerated, producing an even greater number of tiny metal shavings that disperse throughout the high-pressure fuel injection system.

3. The release of these metal shavings into the fuel system can be catastrophic, as it eventually causes the fuel injectors to become blocked and leads to an entire shutdown of the engine. Repair costs for a catastrophic failure are approximately $10,000 and are time-intensive; however, any such repair is futile because it will not actually fix the issue so long as the vehicle is being filled with U.S. diesel fuel.

[1] *See* Ex. 1, "Common Problems: The CP4 Time Bomb," DieselTech.com, available at https://www.dieseltechmag.com/2017/12/common-problems-the-cp4-time (last accessed July 18, 2023).

4. The defective CP4 fuel pump has now been subject to at least ***three*** nationwide safety recalls issued by other automotive manufacturers,[2] yet Defendant Ford continues to conceal the defect to this day.

5. Catastrophic failure can occur as early as mile one, as the fuel injection disintegration process begins at the very first fill of the tank and start of the engine, with pump components beginning to deteriorate and dispersing metal shavings throughout the internal engine components and fuel supply system. And catastrophic failure often causes the vehicle to shut off while in motion and renders it unable to be restarted because the vehicle's fuel injection system and engine component parts have been completely contaminated with metal shards. This presents an inherent and substantial risk to consumer safety—one which Ford itself has recognized in the past—and one which Plaintiff was not aware of prior to purchasing the Affected Vehicle.

[2] *See* Ex. 2, June 9, 2022 Part 573 Safety Recall Report for NHTSA Recall No. 22V406 (regarding CP4 pumps in Dodge Ram and Jeep Grand Cherokee vehicles), available at https://static.nhtsa.gov/odi/rcl/2022/RCLRPT-22V406-1555.PDF (last accessed July 18, 2023); Ex. 3, Nov. 12, 2021 Part 573 Safety Recall Report for CP4 high-pressure fuel injection pumps in diesel FCA and Cummins-engine vehicles, available at https://static.nhtsa.gov/odi/rcl/2021/RCLRPT-21V880-8784.PDF (last accessed July 18, 2023); Ex. 4, July 21, 2021 Part 573 Safety Recall Report for NHTSA Recall No. 21V586 (regarding CP4 pumps in certain diesel BMW engines), available at https://static.nhtsa.gov/odi/rcl/2021/RCLRPT-21V586-2864.PDF (last accessed July 18, 2023).

6. Even short of catastrophic failure, the fragile pump design will inevitably lead to pump component wear that damages the fuel injectors, or cause them to inject fuel at times and rates which cause significant harm to the component parts of the vehicle's engine. There are numerous ways in which the defective pump can harm the engine and related components, including; (1) over-fueling, which decreases fuel economy; (2) broken injector tips; (3) fuel spray hitting the cylinder wall, causing dilution of the lube oil, which damages the engine; (4) over-heating of cylinders causing wear damage to the cylinders; (5) melted or twisted pistons; (6) damaged exhaust valves; (7) damaged turbochargers; (8) hydraulic lock; (9) damaged cylinder heads; (10) damaged exhaust manifolds; and (11) damage and/or loss of emission control (including increases in NOx, particulates, and carbon dioxide).

7. Plaintiff paid a premium for the Truck because diesel engines are traditionally expected to last for a range of 500,000 to 800,000 miles.[3]

8. Well before Ford ever chose to use the CP4 pump, the issue of U.S. diesel fuel lubrication was well-known throughout the auto manufacturing industry,

[3] *See* Ex. 5, WorkTruckOnline.com, *Pros & Cons: Diesel vs. Gas in Class 3-4 Trucks* (Nov. 3, 2011), available at https://www.worktruckonline.com/147984/pros-and-cons-of-gas-vs-diesel-in-class-3-4-trucks (last accessed July 18, 2023); Ex. 6, PickupTrucks.com, Considering a Diesel Pickup? Here Are Costs to Ponder (Sept. 8, 2018), available at https://news.pickuptrucks.com/2018/09/considering-a-diesel-pickup-here-are-costs-to-ponder.html.

but was completely disregarded in the design, manufacture, marketing, and sales or leases of the Affected Vehicles. Ford, as well as fellow domestic automotive manufacturers GM and FCA, had industry-wide experience with catastrophic fuel injection pump failures when cleaner diesel standards were first implemented in the 1990s. By 2002, the Truck & Engine Manufacturers Association ("EMA")—of which Ford has been a longtime member[4]—acknowledged that the lower lubricity of American diesel could cause catastrophic failure in high-pressure fuel injection system components.

9. Ford and its affiliates knowingly and intentionally deceived Plaintiff and American consumers through its consistent representations to consumers in order to sell the Affected Vehicles. Through representations by Ford dealers, and through Ford's advertisements online, in print, on TV, and on the radio, Ford promised Plaintiff and consumers in general the continued reliability of their diesel engines, but with increased fuel efficiency and power at greater fuel efficiency. These representations were false, and Ford failed to disclose the defect, passing along the substantial cost of the defect to Plaintiff and other consumers.

10. Neither Plaintiff nor any reasonable consumer would have purchased or leased these vehicles if Ford's disclosures had been materially truthful. And

[4] *See* 2:19-cv-12365-BAF-APP (E.D. Mich.), ECF No. 89-1, PageID.20682 (Truck & Engine Manufacturers Association (EMA) membership webpage, last accessed Apr. 28, 2023).

certainly, neither Plaintiff nor any reasonable consumer would have paid a premium for these defective trucks or paid the price they were charged.

11. Ford has continued to blame Affected Vehicle owners for the presence of metal wear particles in the fuel, even though these fragments were produced by the pump's faulty design. Ford has further sought to delay vehicle owners' discovery of the damage through re-defining "failure" and delaying repairs, in the hopes that the final and catastrophic failure occurs out of warranty.

12. Plaintiff accordingly brings this Complaint to recover all relief to which he is entitled, including but not limited to recovery of the purchase price of his Affected Vehicle, compensation for overpayment and diminution in value of his Affected Vehicle, out-of-pocket and incidental expenses, disgorgement of Ford's unjustly derived profits, and an injunction compelling Ford to replace or recall and fix the Affected Vehicles.

II. PARTIES

A. The Plaintiff

13. Plaintiff David Clark is a citizen of the State of Texas, and domiciled in Lufkin, Texas. On or around December 2020, Plaintiff purchased a new 2020 Ford 6.7L Power Stroke Diesel F-350 (the "Affected Vehicle") for approximately $76,474.11 from Al Meyer Ford Inc. d/b/a/ Lufkin Ford ("Lufkin Ford"), an

authorized Ford dealership in Lufkin, Texas. Plaintiff purchased his Ford F-350 as his daily driving vehicle and for work purposes to transport trailers.

14. On or around July 28, 2021, with just approximately 23,000 miles on the odometer, Plaintiff experienced a catastrophic failure of his truck's CP4 fuel injection pump. Plaintiff was driving the Affected Vehicle to Houston, Texas when it suddenly went into limp mode and stalled while pulling onto the highway from the fuel station, and subsequently would not restart. He had it towed to Sabine River Ford in Orange, Texas. Once at Sabine River Ford, Plaintiff was told that the CP4 fuel pump had failed due to contaminated fuel. Even though the Affected Vehicle had only 23,000 miles, and was not even a year old, Defendant Ford wrongfully denied coverage for the repair under warranty which cost Plaintiff approximately $12,838. In addition to the repair costs itself and the towing expense, the fuel pump failure also caused Plaintiff to have lost income because he was unable to haul his workloads.

15. When Plaintiff complained about denial of his warranty claim for the failure which occurred at around 23,000 miles, in order to deny warranty claims, Ford blamed Plaintiff for the presence of metal wear particles in the fuel, even though these fragments were produced by the pump's faulty design.

16. In the days and weeks preceding Plaintiff's purchase, and in contemplating his vehicle needs, Plaintiff saw and recalled Ford's television

commercials, internet advertisements, sales brochures, and heard statements from Ford dealerships' sales and service representatives wherein Ford claimed the Power Stroke diesel truck which Plaintiff ultimately purchased had superior horsepower, fuel economy, reliability, and durability compared to other trucks in the American market. More importantly, Plaintiff relied on representations from Defendant Ford through the means listed above that the Affected Vehicle was compatible with American diesel fuel, as all Ford advertisements Plaintiff ever observed contained representations of the Affected Vehicle driving in America as if it were compatible with U.S. diesel fuel—but it is not. Absent these representations, Plaintiff would not have purchased the vehicle, or would have paid less for it, because it is unfit for its ordinary use. Unbeknownst to Plaintiff, at the time of acquisition, the Affected Vehicle contained a defective CP4 pump and fuel injection system that was not suitable for American vehicles, and consequently the Affected Vehicle could not deliver the advertised combination of durability, power, reliability, and fuel efficiency of diesel that Plaintiff relied upon. Neither Ford nor any of its representatives informed Plaintiff of the existence of the unlawfully and unexpectedly defective nature of the Ford Power Stroke diesel engine's CP4 high pressure fuel pump system prior to purchasing. Had Defendant Ford disclosed the defect, Plaintiff either would not have purchased the Affected Vehicle, or would have paid less for it.

17. Ford also failed to inform Plaintiff that the purported "repair" to the CP4 fuel pump in his Affected Vehicle after the aforementioned catastrophic failure involved installing an equally defective CP4 fuel pump which is equally prone to failure. Ford further failed to cover the repair under the 5 year/100,000 mile warranty that came with Plaintiff's Affected Vehicle even though the Vehicle was within the parameters of the warranty.

18. Accordingly, Plaintiff suffered concrete economic injury as a direct and proximate result of Defendant Ford's wrongful, deceptive conduct. As deemed appropriate, Plaintiff's ascertainable losses include, but are not limited to, out-of-pocket payment for the CP4 failure repair, lost wages and income stemming from said repairs and the periods during which Plaintiff was without use of his Vehicle, the full purchase price of the truck, out-of-pocket losses by overpaying for the Affected Vehicle at the time of purchase, decreased performance and fuel economy of the Affected Vehicle, diminished value of the Affected Vehicle, benefit of the bargain damages, mental anguish damages, treble damages under the Texas Deceptive Trade Practices Act ("DTPA"), and punitive damages. Further, Defendant Ford has been unjustly enriched as a result of its tortious conduct, and Plaintiff is entitled to a pro rata share of its disgorged profits.

19. Plaintiff also paid a premium for his Affected Vehicle. Based on his research and knowledge of trucks, Plaintiff knew that diesel trucks were more

expensive than a comparable truck that ran on gas, but he purchased the Affected Vehicle based on his belief that it would be more durable compared to a gas engine, with superior torque, fuel economy, and towing capabilities. The premium for a diesel truck compared to a gasoline equivalent is approximately $5,000-$8,000. Plaintiff accordingly overpaid for his Affected Vehicle by at least the value of this premium.

B. The Defendant.

20. Defendant Ford Motor Company ("Ford") is a publicly traded corporation organized under the laws of the State of Delaware with its principal place of business at One American Road, Dearborn, Michigan, 48126. Ford can be served with process through its agent The Corporation Company, 40600 Ann Arbor Road E. Ste. 201, Plymouth, Michigan, 48170.

21. Defendant Ford is in the business of designing, manufacturing, distributing, and selling Ford automobiles in this District, and in the jurisdiction of the Plaintiff's Affected Vehicle purchase. Ford and/or its agents designed, manufactured, and installed the engine systems in the Affected Vehicles. Ford also developed and disseminated the materially misrepresentative owner's manuals and warranty booklets, advertisements, and other intentionally unreasonable and deceptive promotional materials relating to the Affected Vehicles. Ford also designed advertising material that it sent to Ford Dealerships for the purpose of

having dealers distribute these to consumers, including Plaintiff, and Ford authorized dealers to communicate with consumers (including Plaintiff) about the performance of the vehicles, and Ford ensured that the dealership was a place where Ford could disclose material facts to prospective buyers such as Plaintiff.

III. VENUE AND JURISDICTION

22. Venue is proper in this District under 28 U.S.C. § 1391 in light of the following: (1) Defendant Ford Motor Company's principal place of business is in this District and Ford has designed, marketed, advertised, sold and leased the Affected Vehicles within this District; and (2) many of the acts and transactions giving rise to this action occurred in this District, including, *inter alia,* Ford's design, promotion, marketing, distribution, and sale of vehicles containing the defective Bosch CP4 high-pressure fuel pump in this District. Further, a significant number of the Affected Vehicles were registered in this District and thousands of Affected Vehicles were in operation in this District. Venue is also proper under 18 U.S.C. § 1965(a) because Ford is subject to personal jurisdiction in this District as alleged, *supra*, and Ford has agents, *i.e.,* Ford-certified dealerships, located in this District. Finally, venue and original jurisdiction are proper in this jurisdiction pursuant to 28 U.S.C. § 1332(a) because complete diversity of citizenship exists between all parties and the matter in controversy exceeds the sum or value of $75,000, exclusive of interests and costs.

IV. FACTUAL ALLEGATIONS

A. The Affected Vehicles

23. For purposes of this Complaint, the "Affected Vehicles" consist of the following vehicles: 2011-present Model Year Ford-manufactured diesel-fueled automobiles equipped with a 6.7L Power Stroke engine. All vehicles falling under this Affected Vehicle group were manufactured with the defective CP4 fuel injection pump.

B. Ford Profits from the Rise of Diesel Vehicles in the United States

24. Diesel engines have long enjoyed a loyal following in some U.S. market segments because of their reliability, fuel efficiency, and power. Diesel engines produce higher torque, even at low revolutions per minute ("RPM"), making them popular in buses, heavy-duty pickups, and vans, including commercial vehicles, farm trucks, and ambulances.

25. The key benefits of diesel engines over their gasoline counterparts are the following:

> **(a) Durability:** Diesel (compression ignition) engines are, by design, stronger and more robust than gasoline (spark ignition) engines, and their long life and low maintenance are among the reasons for their popularity.
>
> **(b) Fuel Efficiency:** The diesel engine is 20-35% more efficient than a gasoline engine, because the compression ignition cycle (and greater compression ratio) is more thermodynamically efficient than the spark ignition cycle, and because diesel fuel has a greater energy content on a per gallon

> basis than gasoline. As a result, a diesel engine's fuel cost per mile is expected to be lower than gasoline.
>
> **(c) Torque and Power:** Diesel engines provide more torque, especially at low engine speeds, which leads to better acceleration and higher towing capacity. Modern diesel engines operating at higher speed can now match or exceed gasoline engines in terms of peak power. This combination of torque and power is another reason why some customers prefer diesel.

26. Most Class 2A, 2B, and 3 (1500-3500) series pickup trucks, as well as certain sports utility vehicles sold by the Big Three Automakers (Ford, GM, and FCA)—including the Affected Vehicles at issue in this case—offer both a gasoline and diesel option. Because of the features and advantages listed above, buyers are willing to pay a premium of $5,000-$8,000 more for the diesel-powered versions.[5]

27. The diesel combustion process, invented by Rudolph Diesel over a century ago, uses a hydrocarbon-based fuel which is substantially different than gasoline. Diesel fuel is a heavier and less refined mix of hydrocarbons and is designed to self-ignite when mixed with air under elevated temperatures and pressures. In the diesel combustion process, the fuel is pumped to a very high pressure and then forced into an injector through very small spray holes. This fuel is atomized into spray plumes of fine droplets in the engine combustion chamber. The droplets rapidly evaporate and mix with heated air and spontaneously ignite, thus releasing the energy to drive the piston and pressurize the fuel.

[5] *See* WorkTruckOnline.com, *supra* note 3; PickupTrucks.com, *supra* note 3.

28. Since the invention and early development of the diesel engine more than 100 years ago, the injection of fuel into the cylinder has been one of its greatest technical challenges. Earlier versions of the fuel injection system were designed as a pump-line-nozzle arrangement where a fuel pump delivered fuel directly to each injector via its own fuel line. As emission and fuel economy standards have become more stringent, and customer demands for performance have increased, diesel manufacturers switched to a high-pressure, common rail system, starting in Europe in the 1990s.

29. In a common-rail fuel system, a high pressure pump supplies fuel to a reservoir (a pressure containment vessel) known as the fuel rail. The rail holds an ample supply of pressurized fuel available to be injected (or "metered") into the engine power cylinders by the fuel injectors. The flow of fuel in each injector is managed by a complex electronic control system, which is programmed by sophisticated algorithms and calibration files. The key advancement with the common rail system is that each injector is capable of injecting in multiple precise pulses of fuel and at varying times based on driving conditions.

30. The most complex and expensive part of the common rail fuel injection system are the high-pressure components, including the high-pressure pump, the fuel rails, and the injectors.

31. One of the key benefits of common rail technology is the ability to have multiple fuel injection events in a single injection cycle. Multiple injections, executed by lifting the injector nozzle needle, are used to carefully meter fuel into the cylinder which smooths out the combustion event resulting in lower noise and lower emissions.[6] Modern engines may have multiple injection events, including post injection of fuel used to release fuel into the exhaust stream for the purpose of heating up the after-treatment components to reduce emissions.

32. In sum, the key benefits of modern common rail fuel system are, among others:[7]

- Providing pressurized fuel to well above 2,000 bar[8] across most of the operating range of the engine (previous mechanical fuel systems could only achieve high pressure at high engine speeds).

- Multiple injection events, accurately timed and measured for the precise engine operating conditions to meet stringent noise and emissions regulations, including the following:

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[6] The injectors spray an exceedingly fine mist of diesel fuel into the cylinder, where it ignites and powers the engine. The finer the mist, the less emissions, because the combustion process is more homogenous, which has at least two beneficial effects: (1) the smaller droplets evaporate and mix more readily with the air, preventing the development of fuel-rich "pockets" which product particulate matter; and (2) homogenized levels of heat mean there are fewer high peak temperatures, which lead to formation of NOx. The net effect of the high-pressure system is less NOx and particular matter.

[7] *See* Ex. 7, https://www.bosch-mobility-solutions.com/en/products-and-services/passenger-cars-and-light-commercial-vehicles/powertrain-systems/common-rail-system-piezo/ (last accessed July 18, 2023).

[8] A bar is a unit of measure for pressure. One bar is about 14.8 pounds per square inch; 1,800 bar is equivalent to about 27,000 pounds per square inch.

- Cold-start ability can be improved by early pre-injections to avoid the need for glow plugs.[9]

- Engine noise can be lowered by pre-injections of fuel prior to main injection to produce power.

- Aftertreatment systems (particulate filters) can be regenerated by very late post injections.

- Injection rates can be digitally "shaped" to give an optimum rate of injected fuel to better control the diesel heat release rate, which minimizes NOx emissions.

- Exhaust particulates can also be lowered by injection "post" or late small amounts of fuel.

- High reliability and durability – common rail systems in Europe have been shown to be more reliable and durable than previous mechanical fuel systems if properly fueled and maintained.

- Less maintenance – modern common rail systems are designed to be self-adapting and require little maintenance.

- Less noise, vibration and handling problems – precise control over the injection and combustion events reduces engine noise, runs more quietly, produces less shaking and shock, and produces better operator control over the acceleration of the vehicle. High pressures are only generated in the centralized fuel pump rather than in individual mechanical injectors, which reduces engine vibration and gear train torques and noises.

- Higher injection pressure – pressures up to 2,500 bar (36,000 pounds per square inch) are only achievable with common rail fuel systems. The higher pressures are necessary for improved fuel atomization and more complete combustion.

- Better engine combustion management – the precision control offered by common rail reduces the mechanical strains on the engine, including

[9] A glow plug is a heating device which aids in the starting of diesel engines.

> peak cylinder pressures, temperatures, and observing exhaust aftertreatment system limits.

33. From the outset, Ford was in competition with fellow "Big Three" auto manufacturers and sellers like General Motors ("GM") and Fiat Chrysler ("FCA"), each racing to dominate the growing American diesel vehicle market. Ford looked to the international automotive parts supplier Bosch to increase the fuel efficiency and power of its diesel engines. The heart of this diesel revolution would be powered by Bosch's more durable CP3 fuel injection pump, the predecessor to the CP4 fuel injection pump at issue in this suit. The reliability of the CP3 became key to the "million-mile" performance of diesel truck engines in the United States. In fact, Cummins, who supplies diesel engines to FCA for installation in FCA's trucks, had previously switched to the CP4 in 2019. However, after only two years of production, Cummins also abandoned the CP4 and decided on "reverting back to the tried and true Bosch CP3 high-pressure fuel pump."[10] As this article explains, "beginning on 2010 models the 6.7L Cummins was fitted with a Bosch CP4.2. The CP4.2 is the same high-pressure fuel pump that has proven problematic and prone to premature failure to LML Duramax applications. This switch back to the CP3 ***is a highly welcomed move for Cummins fans***, who will have ***peace of mind*** knowing

[10] Ex. 8, McGlothlin; M, "CUMMINS IS KING (AGAIN)", December 2020, https://www.drivingline.com/articles/cummins-is-king-again/ (last accessed July 18, 2023).

that their injection pump ***will be just as reliable as the engine itself.***" *Id.* (emphasis added).

34. Plaintiff paid a premium for the increased reliability, fuel efficiency, and power of diesel—and Ford claimed to continue to deliver advances in diesel engine technology. In its advertisements and press releases, Ford claimed that the Power Stroke engines, which contained the CP4 fuel pump, would maintain reliability while also increasing fuel efficiency and power. *See infra* §§ (IV)(G) & (J). The oversimplified design of the CP4 fuel pump rendered it cheaper to manufacture, but also increased its need for high lubricity fuel, and increased the likelihood that the ultimate failure would be catastrophic.

C. The Fragile CP4 Fuel Pump Design

35. The Bosch CP4 fuel pump is directly coupled to the engine, which means it is operating whenever the engine is operating. Since the CP4 is a critical part of the engine system it must be designed for very long life and must be capable of operating with commercially available fuel. A sound and robust design would also make it tolerant to fuels that are commercially sold, but do not meet the proper requirements. It should also be designed to withstand some level of customer abuse and neglect, such as inadvertent misfueling, running out of fuel, delaying a filter change, or draining the water separator.

36. The CP4 operates at higher pressures than its predecessor, the Bosch CP3, and has inherently higher Hertz contact stresses than the CP3, which exacerbates the wearing of the pump parts. The CP3 pump has three pumping cylinders and plungers, and as the cam shaft turns, a polygon ring on an eccentric camshaft. As the camshaft rotates, the polygon is moved in a sliding manner against the plunger foot plate and converting rotational (circular) motion into linear (up and down) motion. Below is a diagram of the CP3 pump:

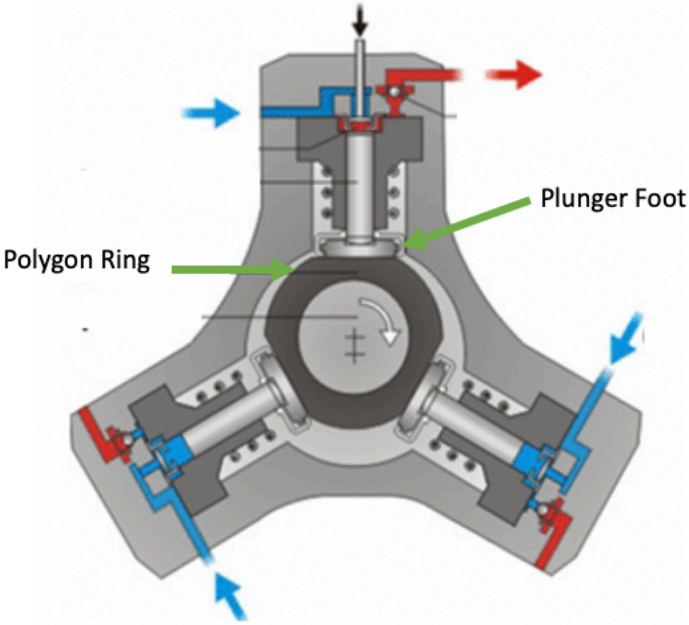

Figure 1: CP3 Pump

37. Because of its sliding foot contact area and lower stresses, the CP3 is more tolerant of poor fuel quality.

38. The CP4 pump design was a radical departure from the CP3, and it relies on a fragile cam-roller-tappet mechanism which did not exist in the CP3.

Instead of the wide plunger foot plates sliding against the wide polygon cam to drive the plungers (as shown in Figure 1 above), the CP4 pump uses a small, 10 mm roller pin (about the size of a AAA battery) as the only source of contact with the camshaft. With this system, the CP4 system is placing a lot of pressure on the contact point between the roller and the cam. This very small area of contact carries all the forces required to transfer the energy to generate the very high pumping pressures. In addition, since the 10 mm diameter roller is about one quarter the size of the camshaft lobe on which it rotates, the smaller roller must rotate 4 times as fast as the CP4 camshaft. Since the Power Stroke engine drives the CP4 at the same speed as the engine, this means the roller must rotate at 4 times the engine speed, or in the range of 11,200 revolutions per minute (for an engine speed of 2,800 rpm). Below is a schematic of the tappet holding the roller pin, which contacts the cam:

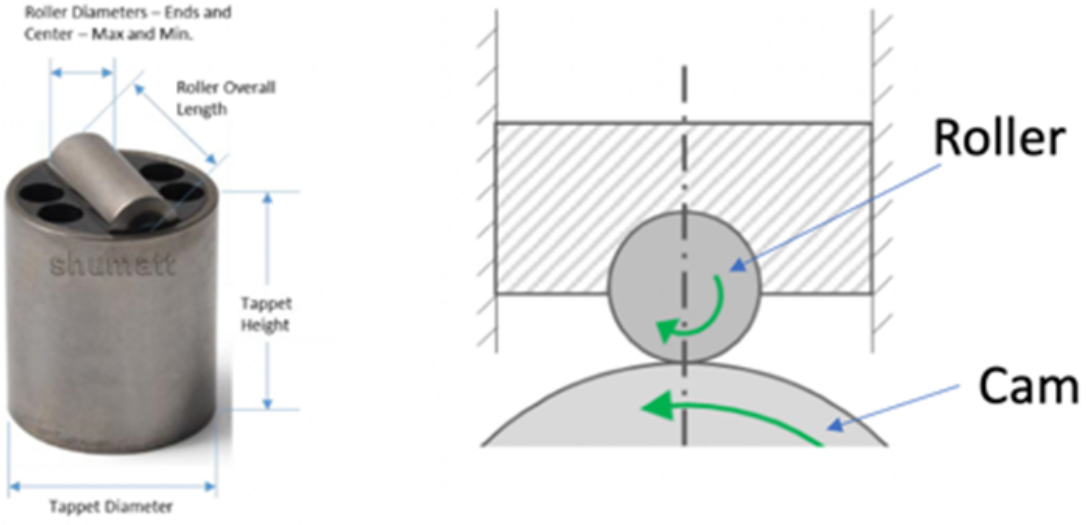

Figure 2: Roller, Camshaft, and Tappet

39. Below is a photograph showing a side-by-side comparison of the CP3 and CP4 pumps, which illustrate how the contact area between the CP4's cam and roller is much smaller than the area between the CP3's ring and plunger foot:

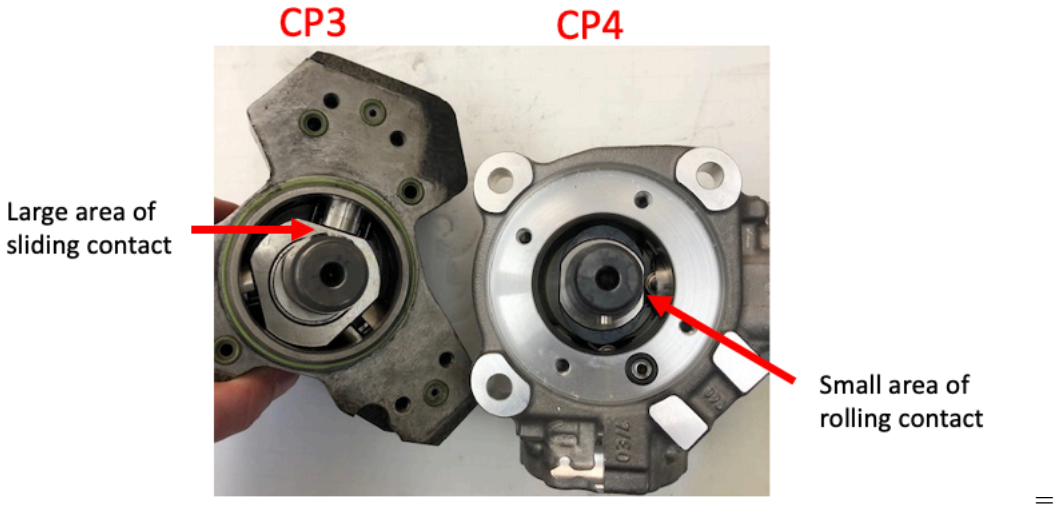

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Figure 3: Comparison of CP3 and CP4 Pumps

40. The design differences are further illustrated in the graphic below, which again shows the large surface contact area between the polygon and the plunger of the CP3 as compared to the small line contact between the cam and the roller of the CP4:

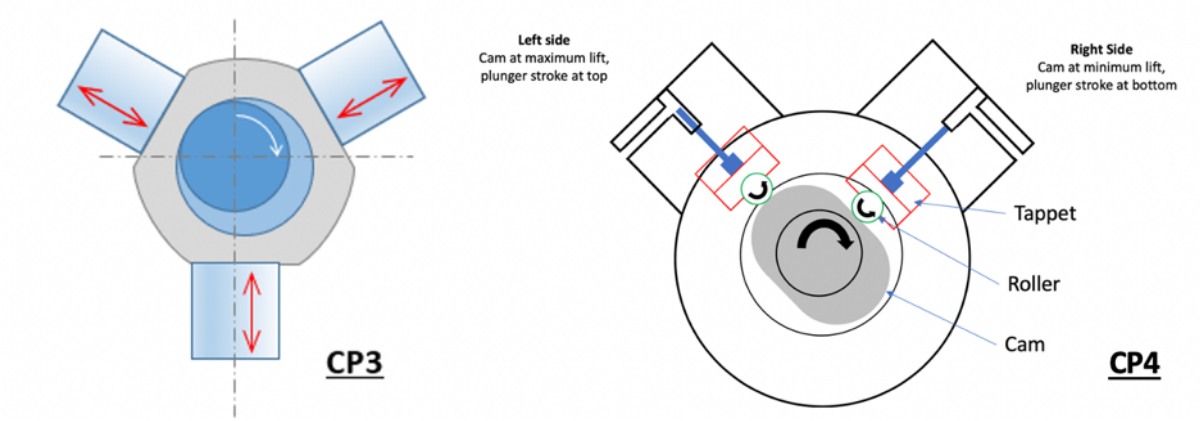
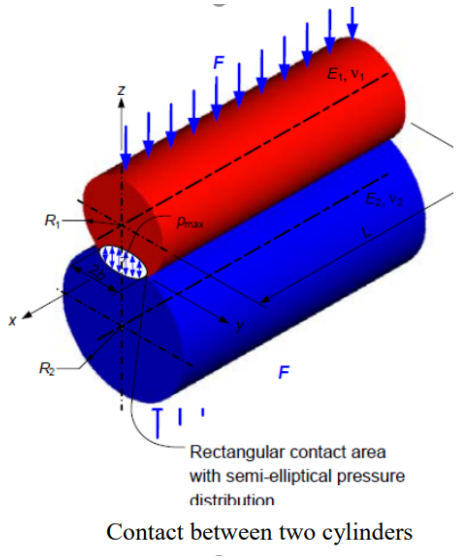


Figure 4: Schematic Comparison of CP3 and CP4 Pumps

41. The CP3 pump's sliding foot design distributes the load and reduces stresses on the polygon cam follower. It slides back and forth and does not need to roll to create a lubricating fluid film. Conversely, the CP4 cam-roller design results in very high forces along a single line of contact. The friction of the roller in the tappet must be less than the friction on the roller cam interface or else the roller will not rotate (or spin); instead it will slide. The roller also creates a hydrodynamic lubrication film of fuel between the roller and cam. This film is very thin, on the order of 1 micron or less (1 micron = 40 millionths of an inch). If the roller stops rotating and sticks or slips on the cam, it loses this lubrication film and starts to wear. In real world operating conditions, the result of all these factors is a lack of robustness because of the susceptibility to contamination through metal shavings or

other debris, caused in part by metal-on-metal rubbing between the roller pin and the cam.

42. The critical roller pin design of the CP4 creates very high stress (called Hertz stresses) as diagramed below:



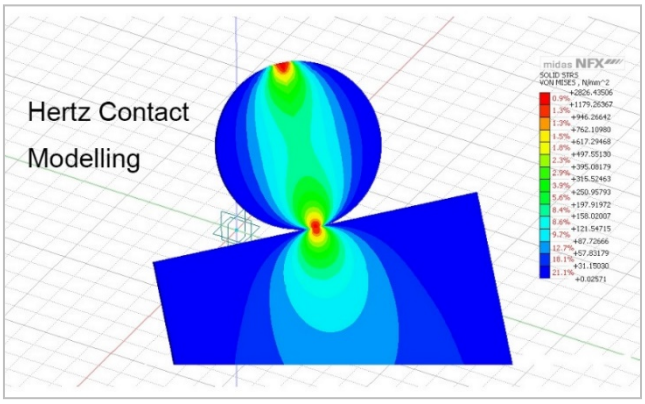


Figure 5: Hertz Stresses on CP4 Roller and Cam

43. Comparing relative Hertz stresses of CP3 and CP4, the CP4 roller-to-cam contact Hertz stresses are about two times higher than the CP3. These higher stresses will increase contact fatigue and wear of the metal parts that come in contact with each other. In the case of the CP4, these parts are the roller and camshaft. Accordingly, use of the CP4 pump for the same amount of force would be more likely to wear and fail than the CP3 for same lubrication conditions of lubricity, viscosity and fuel quality. This would be aggravated and increase wear dramatically

if the roller pin stops rotating and starts sliding. Aggressive roller and cam wear changes the roller diameter to more of a slider and generates wear debris.

44. Unlike the CP3 pump, which uses a sliding elephant's foot design to spread stresses and shortened distance of metal on metal travel, the CP4's cam-roller design results in very high forces along a single line of contact. The friction of the roller in the tappet must be less than the friction on the roller cam interface. The result of all these factors is fragility, and susceptibility to contamination through metal shavings or other debris, caused in part by metal-on-metal rubbing between the roller pin and the cam.

45. The CP4 pump was first introduced in Europe in the 2007 timeframe, and criticism of the pump began almost immediately based on its fragile design and its sensitivity to fuel quality. In addition to the design limitations referenced above, the tappet which houses the roller pin is not prevented from rotating around in its own axis inside the cylindrical pump housing. If the tappet does rotate out of position, the roller pin rotates from parallel to the camshaft, to perpendicular to the camshaft. Once rotated the roller will no longer rotate, and instead the cam slides across the roller, leading to wear and erosion, as a trough is being carved into the cam. The wear and erosion will generate metal shavings that are carried by the fuel throughout the fuel system, including downstream to the sensitive high pressure fuel

injectors. The photograph below shows the severe wear and gouging caused by rotation of the tappet:[11]

Figure 6: Wear on the Cam and Roller

46. The second issue is additional wear due to the metal-to-metal surface contact between the cam and roller, and metal-to-metal contact between the roller and roller shoe. This wear results in the creation of metal filings which can contaminate the fuel system and damage the injectors. The metal-to-metal wear can occur any time the roller stops rotating inside the tappet shoe. Metal particles that lodge inside the roller shoe can effectively jam the rolling pin in a stuck position. In

[11] *See* 2:22-cv-12957, ECF No. 2-6, PageID.164, Tomasz Osipowicz, "Testing of Modern Fuel Injection Pumps," Teka. Commission Of Motorization And Energetics In Agriculture, 2015, Vol. 15, No. 1, 57–60.

addition, low viscosity caused by water in the fuel can reduce the film layer thickness the roller depends on to ride above the shoe.

47. When particles enter the roller shoe, and if the film of fluid is not think enough, the hard diamond-like coating of the tappet roller shoe can wear off. As the coating wears, damage becomes progressively worse, even as the wearing generates more hard and fine particles that can make their way through the fuel system to the injectors. Below is a close-up of the CP4 tappet roller shoe, showing abrasive wear of the coating:

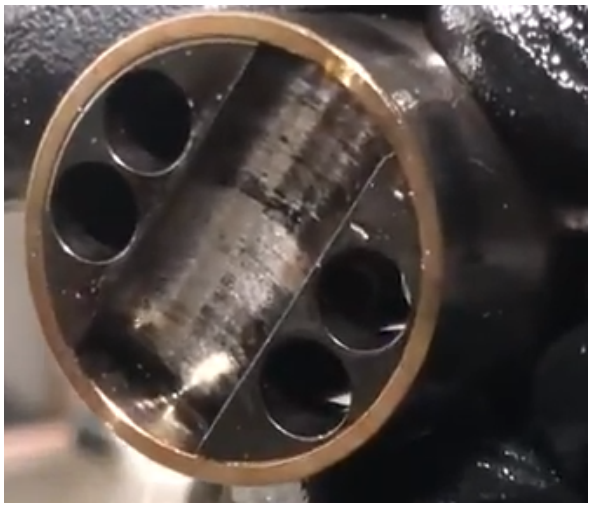


Figure 7: Wear on the Diamond Coating

48. Finally, the pump depends upon the fuel to lubricate the roller pin and the camshaft and prevent wear. U.S. diesel fuel (as explained further below) is refined to a less lubricous specification limit as compared to Europe.

49. Small wear particles (small enough to pass through the engine's filters, or created downstream of the filters through corrosion or wear) are problematic –

and potentially catastrophic – for the CP4 for two reasons. First, if the wear particles come in between the cam and the roller, they can create increased point-contact stresses which can damage the ultra-smooth faces of the components, eventually leading to spalling, cracking or loss of material. Second, if the wear particles lodge between the roller and the roller shoe they can cause the roller to stick. If the roller sticks or stops rolling it can cause the tappet to slide between the cam and the roller or to rotate out of alignment with the cam. Any of these conditions causes stress, metal fatigue, wear, and ultimately catastrophic failure.

50. "Catastrophic" failure can occur through accumulation of wear when the roller skids on the camshaft and aggressively wears to the point of complete roller and tappet breakdown. Large fragments of the worn parts can crack the fuel pump housing and cause fuel leakage to the engine compartment. Migration of wear particles into the common rail, injectors and engine can cause progressive or sudden damage to the pump, injectors, engine, turbocharger and after-treatment systems. Engine stall or failure to start can also occur which leads to a "mission disabling" failure and vehicle limping to a repair shop or on the side of the road.

51. Catastrophic failure also occurs when the level of wear is so severe that the pump plunger is not able to complete the full pressurizing stroke and the fuel pressure target is not achieved. If the pump is completely unable to pressurize the

fuel the engine will either not start, or if it is running the engine will stop. As a result, the vehicle must be towed as it is no longer operable.

52. When a catastrophic CP4 pump failure is confirmed, not only must the pump itself be replaced, the entire high-pressure sub-system consisting of fuel lines, fuel rails, sensors, and injectors must be replaced as well. On the low pressure side, the fuel tank must be drained and thoroughly cleaned, the fuel lines much be flushed, and the both fuel filters replaced.

53. Even if the pump does not catastrophically fail, small, micron-sized metal filings from the wearing process may enter into the high-pressure fuel system. This leads to fuel injector damage, which could impact the precise control of fuel flow. Additional and unwanted excess fuel can lead to a number of issues including damaging or prematurely aging the pistons, cylinders, turbo charger, or the downstream after-treatment components.

54. The defective CP4 pump has been the subject of numerous scholarly and analytical industry articles, which describe how the pump can catastrophically fail, as well as how wear in the pump can generate metal shavings which can cause injector problems and engine over-fueling. For example, a European academic investigator described the problem as follows:

> Fuel injection pump Bosch CP4 is composed of: a drive shaft, a roller in the holder and a plunger pumping section. The most durable component of the tested fuel injection

> pump tested is its plunger pumping section. The roller with its holder is in the pump body. *A defect of this component is lack of stabilization, which causes that the whole roller can rotate 360° in the pump body*.
>
> If the roller starts rotating around its own axis during the pump operation, it is no longer possible for it to return to its original position. Then, it starts destroying a cam on the pump drive shaft. As a result of friction on a cam and a roller, metal filings are generated, fouling and destroying the whole fuel supply system.[12]

55. A second report, presented to the International Congress on Combustion Engines, stated as follows:

> An improper cam-roller-pusher solution is a **fundamental flaw** of this generation of [CP4] pumps. The applied roller significantly contributed to reducing forces in the mechanism by utilizing rolling friction, however the pusher with a circular cross-section had a tendency to rotate, particularly when contaminants were present, friction was elevated by inferior fuel quality or insufficient fuel quantity. When the roller's position changes to perpendicular relative to the shafts' axis, rolling friction changes to sliding friction, which exponentially accelerates the mechanism's wear. Metal filings from the damaged roller destroy inter-operating element of the pumping section, and cause seizing when they penetrate into injectors.[13]

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[12] *Id.* at 57-60, PageID.164-167.

[13] Ex. 9, Bor, M., *et al.,* "Analysis of Hypocycloid Drive Application in a High-Pressure Fuel Pump," MATEC WEB OF CONFERENCES VII INTERNATIONAL CONGRESS ON COMBUSTION ENGINES, 118, 00020 (2017), available at https://www.matec-conferences.org/articles/matecconf/pdf/2017/32/matecconf_icce2017_00020.pdf (last accessed July 18, 2023) (emphasis added).

56. The figure below from one of the academic reports shows the orientation of a rotated tappet and the damage that occurs when the roller rotates on its axis, causing the cam to slide across the roller, rather than rolling together with it:

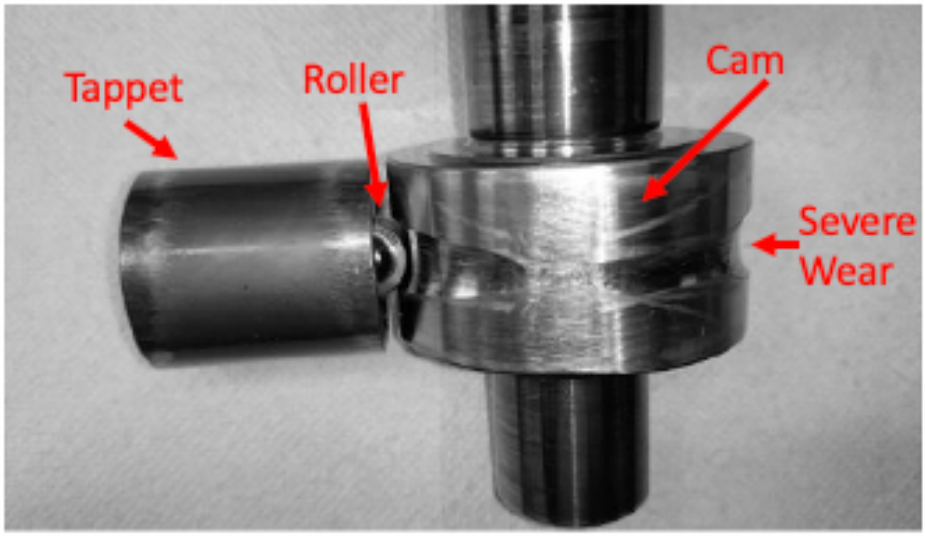

Figure 8: Effects of Rotation of the Roller

57. These same academics summarized the problem as one of design that is highly sensitive to the quality of fuel:

> Due to the high precision of injection process control, with high pressure or fuel compression, these systems are characterized by sensitively to the quality of applied fuel due to the large faces acting on the system's elements. Numerous design solutions are susceptible to damage resulting from defective design of a given element, beside damage generated by fuel of insufficient quality. In the case of pump defects, leading to the creation of filings with diameters below several micrometers, other elements of

> the injection systems are also damaged very frequently, which increase repair costs significantly.[14]

58. As Diesel Tech Magazine, an industry publication, aptly explained in its December 2017 article entitled, "Common Problems: the CP4 Time Bomb:"

> It's always frustrating to finally get your hands on a brand-new truck (or at least, new to you) and find out there's something wrong with it. It's even more frustrating to learn that not only are you not alone in your suffering, but that it's a common problem to your vehicle. . . . To kick things off, we're going to look at something that's very near and dear to our hearts: the CP4 injection pump. . . . Boy, where to begin? People have taken a somewhat hyperbolic approach and refer to the CP4 as a time bomb, among other colorful terms. The thing is, they're not too far from the truth. Even if you have a 100 percent stock pickup, there's a *really* good chance that you're going to be on the receiving end of a $10,000 bill when it finally goes out on you and destroys your entire fuel system.

59. Ford's corporate representative in the related case of *Droesser, et al. v. Ford Motor Co.*,[15] Mr. Brien Fulton, largely echoed the likely consequences of the defective design. In discussing the metal shavings generated by the pump, Mr. Fulton testified that "[t]he surfaces we normally find [the shavings] are on the roller and cam . . . . If you get wear on those portions, the pump – pump performance will start to degrade . . . . If that piston loses its ability to contact the surface, that pump

[14] *Id.*
[15] No. 2:19-cv-12365-BAF-APP (E.D. Mich.)

doesn't as effectively pump that fuel into the rail."[16] Mr. Fulton further described how debris caused by the roller wear (or contamination) can cause the roller to flip or misalign: "The failures we've seen, we've seen the tappet rollers flip or misalign in there."[17]

D. Characteristics of U.S. Diesel Fuel

60. As the foregoing suggests, for the CP4 pump design to work, the properties and quality of diesel fuel are vitally important. Key fuel properties such as minimum levels of lubricity and viscosity must be met at all times throughout the life of the engine in order to at least partially mitigate the damage from the defective pump.

61. The CP4 relies on diesel fuel itself to maintain lubrication. The lubricity of diesel in Europe is more standardized than American diesel, but European diesel is also dirtier. Because the sulfur in diesel exhaust is a major cause of smog and acid rain, in 2007, the EPA required diesel fuel sold in the U.S. to have less than 15 ppm of sulfur. This is known as Ultra Low Sulfur Diesel ("ULSD"). It is produced through a refinery process known as hydrodesulfurization ("HDS"). Sulfur provides some of the lubricity needed for the pump to operate. But the refinery process required to produce low sulfur diesel destroys a variety of important nitrogen and

[16] *See Droesser, et al. v. Ford Motor Co.*, No. 2:19-cv-12365-BAF-APP (E.D. Mich.), ECF No. 87, PageID.19599 (quoting Fulton Dep. 115:5-116:13).
[17] *See id.* (quoting Fulton Dep. 123:9-13).

oxygen based polar and organic compounds that give diesel fuel its lubricity. Indeed, ULSD fuel is considered to be very 'dry' and incapable of lubricating vital diesel fuel delivery components, specifically high-pressure fuel pumps and injectors; as a result, American diesel accelerates the breakdown and wear of the pump, and the fuel injection system components "are at risk of premature and even catastrophic failure when ULSD fuel is introduced to the system."[18]

62. Low sulfur diesel fuel first appeared in American markets in the 1990s, with fewer than 500 ppm of sulfur. It is estimated that 65 million fuel injection pumps failed as a result. It was thought that the pumps failed at the equivalent of 100 to 200 hours of operation. Thus, the critical importance of lubricity for diesel injection pumps was well known to all auto manufacturers for a decade or more before Plaintiff's Affected Vehicle was designed or introduced into the market.

63. The main body that sets standards for diesel fuel is the ASTM;[19] the specific standard for U.S. diesel fuel is known as the ASTM-D975, which has been adopted by the EPA as a binding regulation.[20] Lubricity in diesel fuel is quantified

[18] *See* ECF No. 89-3, PageID.20704, Arlen Spicer, *Diesel Fuel Lubricity Additives: Study Results*, THE DIESEL PLACE, Aug. 26, 2007, available at http://www.jatonkam35s.com/DeuceTechnicalManuals/Diesel_fuel_additive_test.pdf (last accessed July 13, 2023).

[19] "ASTM" previously stood for the American Society for Testing and Materials. Now, however, the ASTM standards are negotiated and implemented worldwide. The governing body is currently known as ASTM International.

[20] 40 C.F.R. § 80.1468.

as measurement of wear. A test method called a high frequency reciprocating rig (HFRR) involves oscillating a weighted ball across a flat plate and measuring the scratches or "wear scar" pattern on the surface. The diameter of the wear scar is thus an indicator of lubricity, with larger diameters indicating low (poor) lubricity fuel and smaller diameters indicating high (better) lubricity fuels.

64. In the U.S., the minimum HFRR wear scar diameter is 520 um, compared to the European standard of 460 wear scar. Since the CP4 pump is self-lubricating with the diesel fuel it is pumping, the lubricity of U.S. diesel is crucial to the pump's durability and longevity. And since the lubricity of the diesel fuel is a critical factor in the durability of the pump, careful attention should have been paid to the difference in U.S. and European fuels.

65. Engine manufacturers were well aware of the mismatch between engine part specifications that require a maximum of 460 wear scar, and the lower lubricity specifications of Ultra Low Sulphur American diesel fuel:

> Lubricity describes the ability of a fluid to minimize friction between, and damage to, surfaces relative to motion under loaded conditions. Diesel fuel injection equipment relies on the lubricating properties of fuel. Shortened life of engine components such as fuel injection pumps and unit injectors can usually be attributed to lack of fuel lubricity and, hence, lubricity is

> of concern to engine manufacturers. This property is not addressed adequately by ASTM D 975.[21]

66. Further, the EMA made clear:

> Regardless of the fuel sulfur level, ASTM D975 currently requires lubricity specified as a maximum wear scar diameter of 520 micrometers using the HFRR test method (ASTM D6079) at a temperature of 60°C. Based on testing conducted on ULSD fuels, however, fuel injection equipment manufacturers have required that ULSD fuels have a maximum wear scar diameter of 460 micrometers. EMA recommends that the lubricity specification be consistent with the fuel injection equipment manufacturers' recommendation.

8/8/2005 Engine Manufacturers Association, Position Paper titled "North American Ultra Low Sulfur Diesel Fuel Properties."[22]

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[21] Ex. 10, *EMA Consensus Position: Joint EMA/TMC Pump Grad Specification for Premium Diesel Fuel*, TruckAndEngineManufacturers.org (Apr. 22, 2002), available at http://www.truckandenginemanufacturers.org/file.asp?A=Y&F=20020422+EMA+Consensus+Position+Pump+Grade+Specification%2Epdf&N=20020422+EMA+Consensus+Position+Pump+Grade+Specification%2Epdf&C=documents (last accessed July 18, 2023).

[22] U.S. automotive industry-wide knowledge of the need to manufacture vehicles with equipment capable of handling the U.S.'s low-lubricity diesel fuel many years before the manufacture of the vehicles at issue here corroborates Ford's knowledge of the problem from the company's very inception. *See, e.g., Click, et al. v. General Motors LLC*, No. 2:18-cv-00455 (S.D. Tex.), ECF No. 83 at 12 (internal citations omitted) ("GM complains that it cannot be charged with knowledge about the CP4 fuel pump before it actually began incorporating those fuel pumps into its vehicles . . . . But that assumes, contrary to product development and industry standards, that a manufacturer has no responsibility to research and test products prior to manufacturing them."); *In re Gen. Motors LLC CP4 Fuel Pump Litig.*, 393 F. Supp. 3d 871, 879 (N.D. Cal. 2019) (upholding Plaintiffs' CP4-defect-based fraudulent concealment claims against GM based on the following allegations which largely

67. In a September 2009 Common Position Statement published by the Joint Diesel Fuel Injection Equipment Manufacturers ("Joint FIE Manufacturers") regarding Fuel Requirements for Diesel Fuel Injection Systems, the Joint FIE Manufacturers expressed the following key points to their colleagues in the automotive industry:

> The continuous world-wide tendency to increase engine performance and reduce emissions has necessitated the development of new generations of enhanced diesel fuel injection equipment, supporting the achievement of stringent legislation targets. Rising injection pressures and multiple injections result in higher operating temperatures, increased contract pressures and reduced clearances . . . . Alterations to fuel quality, e.g., by increasingly severe refinery hydroprocessing being introduced to remove Sulphur also reduce the content of aromatics and destroy surface active compounds and antioxidants. ***Removal of these beneficial compounds effects boundary lubrication, commonly known as lubricity, and inherent oxidation stability and must be compensated for.*** Fuel parameters such as cetane number, viscosity, density, lubricity, oxidation stability, sulfur and aroma content, together with the absence of free water and dirt contamination, are key parameters required to ensure performance of equipment in the field.
>
> Biofuels are becoming increasingly available to end-users [including] in the United States of America . . . . It must be recognized that the physical and chemical characteristics of

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mirror the allegations here: "Plaintiffs allege that GM became aware of the need to install equipment capable of handling low lubricity diesel fuel many years before manufacturing the vehicles at issue here, because the entire automotive industry had 'experience[d] . . . widespread catastrophic fuel injection pump failures when cleaner diesel standards were first implemented in the 1990s.' Compl. ¶ 6. When low-sulfur diesel 'first appeared in the American market in the 1990's,' an 'estimated . . . 65 million fuel injection pumps failed as a result.'").

> bio components are significantly different to conventional fuels and that care must be taken in their specification and use.
>
> Diesel fuel injection equipment (FIE) manufacturers fully support the development of alternative sources of fuel . . . . ***However, many vehicles, engines and equipment are not designed to run on them. It is recommended to refer to the vehicle and engine manufacturers 'Limitations of Use' documents for guidance.***[23]

68. Likewise, in a July 2014 study on the use of fuel injection equipment with global diesel fuels, Parker Racor, the leading global supplier of diesel fuel filtration systems, explained the following:

> The increase in system pressures in diesel engines has a significant effect on filtration requirements. These systems are highly vulnerable to many forms of contaminants and the need for robust high efficiency filtration has never been higher . . . . An analysis of global diesel fuel quality shows that although the fuel quality in the developed markets has improved, significant quality concerns still remain. Levels of water and contaminants remain at levels that can cause long term issues to the latest fuel injection systems. Specifically, the levels of contaminants smaller than 5 microns remain very high. These particles can be small enough to pass into the internal clearances of high pressure fuel injection systems and can lead to erosion and wear of critical areas leading to a loss in system performance and eventually system malfunction. Diesel filtration balances pressure drop,

[23] *See* 2:19-cv-BAF-APP, ECF No. 89-8, PageID.20963, Joint FIE Manufacturers, *Fuel Requirements for Diesel Fuel Injection Systems: Diesel Fuel Injection Equipment Manufacturers: Common Position Statement 2009*, Sept. 2009, available at https://advancedbiofuelsusa.info/fuel-requirements-for-diesel-fuel-injection-systems-diesel-fuel-injection-equipment-manufacturers-common-position-statement-2009/ (last accessed July 18, 2023) (emphasis added).

> useful life and efficiency. ***However the real long term effect on fuel system life is often not adequately considered[,] as much of the engine durability testing performed is done using high quality fuel that doesn't represent the range of fuels seen in the market.*** Consideration of filtration performance under less than ideal conditions is necessary to develop an acceptable level of protection.

2:19-cv-12365-BAF-APP, ECF No. 89-9, PageID.20967, Steven Hardison & Adam Pearce, *July 2014 Summary of Fuel Injection Equipment with Respect to Diesel Fuel Filtration,* PARKER RACOR & AVL, Jan. 7, 2015, available at https://www.parker.com/literature/Racor/RSL0194%20Rev%20-%20(TAP_AVL-Fuel-Study-Racor).pdf (last accessed July 18, 2023), at i; *see also id.* at 13 ("Careful monitoring of fuel quality and filter performance is needed to protect sensitive diesel engine injection systems"); *id.* at 29 ("To avoid costly engine fuel system components damages, advance multi-stage filtration is recommended"); *id* at 31 ("Modern high pressure diesel fuel injection systems contain very small internal clearances and are vulnerable to any build-up of deposits on these components…. This issue has become a significant concern in the industry").

69. Most diesel fuel in the United States is produced by distillation of petroleum oil in a refinery. The fuel is refined and processed to meet certain specifications outlines in regulations and guidelines adopted by the EPA. The refinery also blends additives into the fuel to meet the applicable specifications. Once U.S. diesel fuel is produced in the refinery it enters a distribution system where

it travels to terminals and then ultimately to a fuel pumping station. In the U.S., fuel may be transported in a variety of ways included pipelines, trucks, and rail. The figure below is a schematic showing the flow of fuel from its source (crude oil) through refining and distribution:

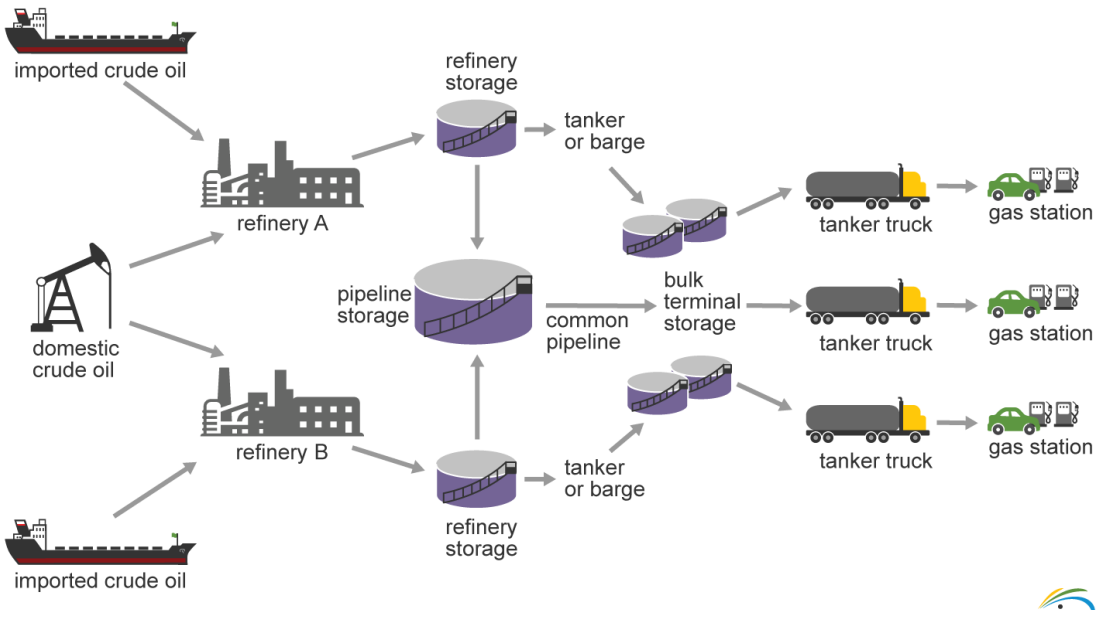

Figure 9: Transport of Fuel from Source to Gas Station

70. Fuel is tested to ensure it meets ASTM specification once it leaves the refinery and again when it leaves the bulk terminal. Fuel may be blended (with biodiesel for example), or enhanced with various additives at either the refinery or the terminal. Although there is a system in place to try to achieve uniformity of fuel quality, as described below, in practice there are a number of factors that lead to the frequent production of substandard quality fuel.

E. The Unreliability of U.S. Diesel Fuel

71. Despite EPA requirements, in reality, U.S. diesel frequently contains even less than 15 ppm, a truth that is widely known within the U.S. automotive industry.

72. Notably, according to Infineum's[24] 2014 Worldwide Winter Diesel Fuel Quality Survey testing 341 diesel fuel samples from around the world, all diesel fuel samples the organization collected and tested from the U.S. and Canada contained sulfur levels of 10 ppm or less.[25]

73. Other fuel surveys indicate that U.S. diesel scar differs drastically across the continental U.S. and does not uniformly offer sufficient lubrication for the pump. By way of example, in 2018 Infineum conducted a survey of the lubricity of U.S. diesel fuel from various regions of the continental U.S. and found the following:

[24] Infineum is a company that is globally recognized as the leader in diesel fuel quality surveys.

[25] No. 2:19-cv-12365-BAF-APP, ECF No. 89-6, PageID.20789-20790, *Infineum Worldwide Winter Diesel Fuel Quality Survey 2014,* INFINEUM INT'L LTD., available at https://www.infineuminsight.com/media/1094/wdfs-2014-intro-and-trends.pdf (last accessed July 18, 2023), at 6-7.

	Minimum lubricity scar score	Maximum lubricity scar score	Mean	Sample size	Locations exceeding 520 wear scar	Locations exceeding 460 wear scar	Locations exceeding 400 wear scar
East Coast	219	506	385	10	0	1	5
Midwest	198	526	390	37	1	9	24
West Coast	289	526	448	10	1	6	7
Total				57	2	16	36

Table 1: Survey of Lubricity of U.S. diesel fuel (2018)[26]

74. Based on this chart, it is clear that there are certain locations where the fuel's lubricity will further accelerate the breakdown and wear of the pump. Over the course of an Affected Vehicle's lifetime, a truck owner will likely use diesel fuel that is "dry," which will accelerate the damage to the engine outlined herein.

75. However, with the advent of ULSD fuel, high lubricity fuels are hard to obtain and the consumer has no way of knowing the lubricity of the fuel at a standard retail filling station. To that extent, the numbers listed in Table 1 are troubling: nearly two thirds of all diesel fuel stations sell diesel fuel that exceeds the maximum lubricity score that Bosch indicated was "strongly recommended." About three in 10 diesel fuel stations exceed European standards. Based on this data, it seems all but inevitable that truck owners will eventually fill up their trucks with diesel fuel that is "dry" and harmful to the trucks' engines.

[26] *See* Ex. 11, https://www.infineuminsight.com/media/2228/infineum-wdfqs-2018-v10-14112018.pdf (last accessed July 18, 2023).

F. Water and Contamination in U.S. Diesel Fuel

76. U.S. diesel fuel can also easily degrade and move off specification during transportation and storage, including from the entry of water into the fuel.27 Water can seep into the fuel supply, which decreases the fuel's viscosity.28 During transfer of fuel – either from refinery to storage tanker, or from tanker to the pump – air can get into the fuel. When the air cools, water condenses and drops into the tank. If this occurs, the fuel loses viscosity, which has a directly negative effect on its lubricity, resulting in an insufficient layer of protection between the roller pin and the tappet shoe.

77. The potential for water to get into the fuel supply is a well-known and easily anticipatable problem for OEMs such as Ford. Diesel fuel tanks "breathe" through filler caps and vents, and as fuel is withdrawn by the fuel pump, humid air can enter the fuel tank and water can condense when the fuel tank cools.

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[27] *See* No. 2:21-12497-LVP-CI, ECF No. 20-20, PageID.905, Chapman, R. "Why Fuel Quality Standards are Important", STI Webinar – Petroleum Storage Tank Maintenance, Innospec, 2013, available at https://www.steeltank.com/Portals/0/Shop%20Fab/12.18.13STI%20webinar%20Fuel%20Specs%20FINAL.pdf (last accessed July 13, 2023).

[28] Viscosity is a measure of the thickness of a liquid, which can affect the lubricity. Generally, a viscous liquid is more lubricious, although there are many exceptions: corn syrup is viscous but not lubricious; cooking spray is not viscous but is lubricious.

78. Diesel fuel can become contaminated by dirt or corrosion particles. Fuel tanks can become rusty through exposure to air. The net result of contamination is the particles clog up the two filters in the fuel injection system.

G. Historical CP4 Failures and Industry Knowledge Thereof

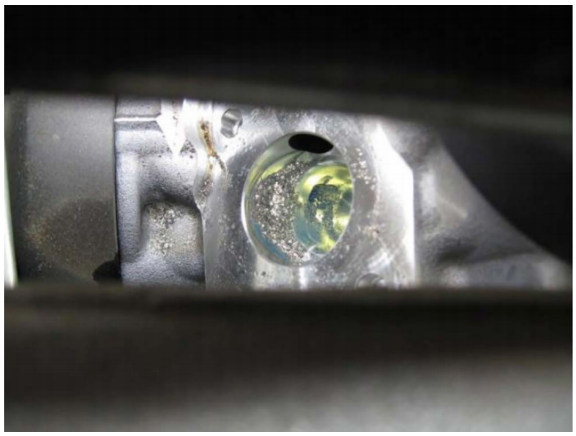
79. The Bosch CP4 fuel injection pump was defective and particularly incompatible with U.S. diesel fuel from the very beginning. For example, on February 7, 2011, the National Highway Traffic Safety Administration's ("NHTSA") Office of Defects Investigation ("ODI") opened a safety investigation based on 160 complaints "alleging incidents of engine stall and/or loss of power that appear to be related to high pressure fuel pump ("HPFP") failures in certain model year (MY) 2009 through 2010 Volkswagen Jetta and MY 2010 Volkswagen Gold and Audi A3 vehicles equipped with [turbo diesel engine] clean diesel engines. Approximately half of the reports indicate that the failure resulted in an engine stall incident, with many of these alleging stall incidents at highway speeds in traffic with no restart." During this investigation, ODI requested documents not only from Volkswagen and Bosch, but also from GM, Ford, and FCA. Documents that the OEMs produced were subsequently published on NHTSA's website.

80. These documents demonstrate widespread and early knowledge of the defect and its potentially catastrophic effects. Some of the disclosures from these documents is provided below.

81. In September 2009, Bosch, at the time supplying the defective CP4 fuel pump to Audi and Volkswagen, received a notice from Audi about a "3rd HPP failure" in the U.S., explaining, "I'm afraid there's bad news from the U.S.: After 2 failures in the field … the 3rd HPP failure has now occurred in the EC endurance run."[29] Photos attached to the email show the failed Bosch CP4 fuel pump, replete with metal shavings in the gasket:[30]

[29] 2:19-cv-12365-BAF-APP, ECF No. 89-11, PageID.21038, Sept. 2, 2009, email from Audi representative to Bosch representatives regarding "3rd HPP Failure USA," produced in response to NHTSA Inquiry EA11003EN-00639[0], available at https://static.nhtsa.gov/odi/inv/2011/INRD-EA11003-59428P.PDF (last accessed July 18, 2023), at 146.

[30] *Id.* at 148-50.



Figures 11-13: CP4 Pump with Shavings

82. In August 2009, Audi sent Bosch a failed CP4 fuel pump for analysis after "[t]he high pressure fuel pump failed catastrophically shedding metal shavings throughout the entire fuel system . . . . This car will require a complete new fuel system from tank to injectors and everything in between. This will be a very lengthy repair (weeks) . . . . We need to determine if component failure or bad fuel is to blame." March 7, 2011 Bosch submission to NHTSA in response to Inquiry No. INRD_EA11003, document entitled, "INRD_EA11003-59347P.pdf," at 35. Thereafter, on September 1, 2009, Bosch responded to Audi with the following analysis note from their failed pump inspection: "Gentleman, [t]he pump mentioned below was analyzed. The result of the finding is sand-like particles in the fuel. ***Defect caused by customer.***" *Id.* at 38 (emphasis added).[31]

[31] *See also* Ex. 13, March 7, 2011 Bosch submission to NHTSA in response to Inquiry No. INRD-EA11003, document entitled, "INRD-EA11003-59347P.pdf," at 21 (Mar. 31, 2008 email from Volkswagen to Bosch re: "Radio: Drivetrain damage failure US07 (Jetta)," in which the parties are discussing an HPFP failure in a 2007

83. In May 2010, after analyzing foreign particles found in the fuel filter of a failed Audi diesel engine and determining that the biodiesel used in the subject engine was "insufficient[ly] cleans[ed]" resulting in deposit formation "which is not conducive to establishing the lubricating film in the [fuel pump] roller support," Bosch noted that, "When [diesel fuel] viscosity is too low, the lubricating film is not established properly and mixed friction and surface contact occurs = bad."[32]

Jetta and the Volkswagen representative states, "Can you (panel of experts) explain to us how the failure mechanism was after this mileage? . . . . We will certainly not accept a failure because of fuel quality! . . . . We also see a big risk here for our BIN5 pump, which has to manage with the same fuel in USA"); Ex. 14, May 2012 Bosch submission to NHTSA in response to Inquiry No. INRD-EA11003, document entitled, "INRD-EA11003-59334P.pdf," at 9-10 (Jul. 4, 2008 email from Audi to Bosch re: "CP4 BIN5 3rd and 4th failure in USA," analyzing root cause of CP4 field failures and positing, "Why is it that EC pumps do not fail? Because of a different fuel?"); *id.* at 13-14 (Jul. 11, 2008 email between Audi and Bosch representatives re: "W19 BIN5 pump failure" in which Audi writes, "For the zero error meeting in FeP on Tuesday we expect the information discussed at the error meeting on endurance testing of fuels with 'poor lubricity, containing water etc.' and all failures, drivetrain damage in all component, system and other endurance runs of Bosch and all customers"); Ex. 15, Jul. 27, 2012 Bosch submission to NHTSA in response to Inquiry No. INRD-EA11003, document entitled, "INRD-EA11003-59345P.pdf," at 7 (emphasis added) (Jun. 30, 2009 email between Bosch and Audi representatives re: "ANS: HPP measures/ USE," in which the Audi representative writes, "I don't think you're reading my mails anymore! Please look at the failure curves specifically, then you'll see that ***we only have a problem in certain markets[.] . . . Depending on how poor the fuel currently on the market is***"); *id.* ("I'd prefer to have a more robust pump").

[32] Ex. 15, Jul. 27, 2012 Bosch submission to NHTSA in response to Inquiry No. INRD-EA11003, document entitled, "INRD-EA11003-59345P.pdf," at 12–14 (May 26, 2010 email chain between Audi and Bosch representatives re: "Particle analyses, fuel filter").

84. In a June 2010 email chain between Bosch and representatives of Audi and Volkswagen regarding the catastrophic failure of a CP4 pump in a 2010 Audi A3 TDI diesel vehicle (published on NHTSA's website), Audi asked Bosch, "[W]hy are the defects mentioned below still present after replacing the high-pressure pump and the injector? What could the [dealer] have done wrong by way of incorrect repair so that such defects are appearing?" Bosch responded that "In this case the complete fuel system (HPP, rail, injectors, all lines) need to be changed . . . . I assume that because of the 'cruncher,' the entire system is contaminated with chips, which are then pumped in circulation and can soon lead to the next failure! The rough running can be explained by the fact that a chip is already present before or in the injector and is impairing its function."[33]

[33] *See*, *e.g.*, Ex. 14, July 7, 2008 email between Audi and Bosch representatives re: "Performance drop AU716 98017 with shavings in the HPP," discussing how "[s]omething is disintegrating" in the Audi 716 fuel pump and that "[w]e are a bit speechless" about "[t]he shavings, or whatever it is"), submitted as part of Bosch's May 2012 responses to NHTSA ODI Inquiry No. INRD-EA11003, document entitled, "INRD-EA11003-59334P.pdf," at 6; *id.* at 27 (Jul. 31, 2008 email from Audi representative re: "Fuel quality in [**REDACTED**]," stating that, "With our [Audi's] V6TDI with the high-pressure pump CP4.2 we have significantly higher failure rates in [**REDACTED**] (higher by a factor of approx. 30 than the average of all markets) . . . . Have you any information suggesting that such a thing could be possible with this country-specific diesel fuel?"); *id.* at 28-31 (Feb.-May 2011 email chain between Audi, Volkswagen and Bosch representatives re: "Status CP4 USA," in which the parties discuss the substantial increase in warranty claims with the implementation of the CP4 in vehicles in the U.S. market).

85. In June 2011, Bosch received a report from Volkswagen regarding a CP4 pump failure in a 2.0L Volkswagen TDI in which the Volkswagen representative explained, "I have here a pump from [sic] a 2.0L TDI. I have been testing a lot of these this week and many have an amount of 'metal Debris' or other metallic particles in them."[34]

86. By the end of 2011, it was well known that Bosch CP4 failures in U.S. Audi and Volkswagen vehicles were widespread and catastrophic.[35]

87. Although many of the communications cited above in the NHTSA investigation involved Bosch and Audi or Volkswagen, Ford almost certainly would have heard about these problems early on. Vehicle manufacturers such as GM, FCA,

[34] Ex. 13, Mar. 7, 2011 Bosch submission to NHTSA in response to Inquiry No. INRD-EA11003, document entitled, "INRD-EA11003-59347P.pdf," at 12 (Jun. 9, 2011 email from Volkswagen Group of America, Inc. to Bosch re: "2.0L TDI Fuel Pump").

[35] *See* Ex. 15, Jul. 27, 2012 Bosch submission to NHTSA in response to Inquiry No. INRD-EA11003, document entitled, "INRD-EA11003-59345P.pdf," at 69 (Sept. 15, 2011 email from Volkswagen to Bosch: "I think the [CP4] failures are well known. It is also important to know that not only the high-pressure fuel pump, but the entire injection system is to be replaced in case of damage to a HPP with a cost >[REDACTED] caused by chip contamination") (emphasis added); *see also* 2:19-cv-12365-BAF-APP, ECF No. 89-12, PageID.21040, Mar. 22, 2011, email from Bosch employee to Volkswagen employees regarding analysis of failing CP4 fuel pumps, produced in response to NHTSA Inquiry EA11003EN-00639[0], available at https://static.nhtsa.gov/odi/inv/2011/INRD-EA11003-59428P.PDF (last accessed July 13, 2023), at 11 (showing that, by March 2011, Bosch was continuing to receive "a respectable number" of CP4 "mechanical breakdowns" in the U.S.); *id.* at 19-22 (spreadsheet showing results of Bosch's pre-analysis of HPFP failures in Volkswagen/Audi vehicles where "metal chips found in fuel system").

and Ford, and component manufacturers such as Bosch, Delphi, and Cummins, have significant and dedicated departments which continuously monitor regulatory compliance with safety, emissions, customs, and tax laws. Their marketing departments monitor their competitors and public domain information to track emerging trends which may impact their business, such as the release of new competitive products or problems with commonly used components on other manufacturer's products. These departments maintain extensive databases of competitive information including design details, teardown analyses and reverse engineering to maintain their competitive edge or comparative advantage. These databases are searchable by employees and information is pushed to new product development teams.

88. Specific departments in OEMs (including Product Compliance, Liability, and Environmental Management) will monitor many public (and subscription) sites such as truckandenginemanufacturers.org, NHTSA.gov, EPA.gov, the California Air Resources Board (ww2.arb.ca.gov), and international agencies (e.g., www.cen.eu, ASTM.org) to ensure compliance with all standards, regulations and awareness of changing regulations, recalls, and safety-related issues, among others. They will also subscribe or fund firms to do this analysis and information gathering for them. They also employ lobbyists in government agencies

to keep abreast of new situations. These firms are all well informed about market conditions and product liability potential issues.

89. In addition, the federal Safety Act and related regulations require the quarterly submission to NHTSA of "early warning reporting" data, including claims relating to property damage received by the automotive manufacturer, warranty claims paid by the automotive manufacturer, consumer complaints, incidents involving injury or death, and field reports prepared by the automotive manufacturer's employees or representatives concerning failure, malfunction, lack of durability, or other performance issues.[36]

90. Emerging problems (such as the NHTSA investigation of Volkswagen/Audi CP4 pump failures) would certainly be tracked by Ford and other OEMs. There are federal regulatory requirements mandating such tracking. Relevant information would then be condensed and pushed to design, development, testing, service and quality departments to ensure that they were aware of these emerging problems. These global firms maintain extensive bodies of knowledge such as "lessons learned" or "engineering standard work" databases to ensure that problems encountered internally or externally are codified into their own standards and disseminated to working levels of engineering, design, quality and service. "Lessons learned" from competitors are invaluable since they avoid similar problems during

[36] 49 U.S.C. § 30166(m)(3); 49 C.F.R. § 579.21.

development and production. These "lessons learned" databases are particularly important when OEMs develop global products at multiple engineering centers around the world. "Lessons learned" and competitive benchmarking are key steps in the Design Validation Planning of all major OEMs and part of their "Value Analysis" studies for New Product Introduction.

91. In addition, working level engineers and designers also are encouraged to join trade organizations such as the Society of Automotive Engineers, American Society of Mechanical Engineers, and ASTM, and to subscribe to many trade publications and tradeshows to stay current with changing requirements and competitive information. When a new product, regulation, standard, or issue is being announced or rumored, all major automotive news organizations will investigate and report on these developments since they are crucial for the OEMs' business. Product problems are also tracked closely since they affect stock market valuations and warranty accruals in SEC filings.

92. Government organizations such as NHTSA, EPA, and CARB routinely push information to OEMs and require responses to ensure that they are on notice of emerging safety issues, recalls, emissions and safety compliance changes. This information is required to be published broadly by OEMs within their internal websites to employees to put them on notice, and there are compliance audits to ensure that employees are trained and certified where necessary.

93. NHTSA recalls and investigations would certainly be communicated to the product development, quality, purchasing, and service teams.

94. Accordingly, information about the CP4 pump's problems would have been widely known throughout the industry, and certainly known to Ford and Defendant Ford Dealerships.

95. Ford even acknowledged in its January 20, 2012, response to NHTSA's investigation of high-pressure fuel pump failures that "Inadequate lubricity can result in increased tailpipe emissions, excessive pump wear and, in some cases, catastrophic failure."[37] According to Ford's corporate representative, Ford's acknowledgement to NHTSA regarding inadequate lubricity was only a year after the Affected Vehicles began to be sold and would only have been driven 5,000-25,000 miles.[38] In other words, the CP4.2 pump began to fail right away.

96. Importantly, the field data Ford itself submitted to NHTSA in January 2012 was already sufficient to detect a serious defect involving the CP4 fuel pump in Plaintiff's Affected Vehicle. Among other things, Ford submitted records of more than one hundred 2011 MY F-Series diesel trucks which experienced engine

[37] *See* No. 2:19-cv-12365-BAF-APP, ECF No. 89-10, Letter from Mr. Steven M. Kenner (Ford) to Mr. Frank S. Borris (NHTSA Office of Defects Investigation re: NHTSA Investigation No. EA11-003:NVS-213hkb, Jan. 20, 2010, available at https://static.nhtsa.gov/odi/inv/2011/INRL-EA11003-50102P.pdf (last accessed July 18, 2023).

[38] *See* No. 2:19-cv-12365-BAF-APP (E.D. Mich.), ECF No. 87, PageID.19629 (quoting Fulton Dep. 178:6-22).

destruction due to the defective CP4 fuel pump—many of which Ford identified as "Root Cause: Poor lubricity Fuel."[39] Ford was aware of the field reports of high-pressure fuel pump failure in at least the 2011 model year F-Series, many of which involved moving stalls.

97. A major quality control measure used by Ford and other automotive manufacturers is to compare a particular model year vehicle's warranty claims and other aggregate information (such as driver complaints and field reports) with the preceding model year vehicle's data to evaluate whether there is a measurable uptick in the failure rate. In modern day vehicle production, failures are typically measured per thousand vehicles or sometimes even per hundred thousand vehicles, and defect trends are frequently identified after just one or several reported failures.

98. In addition, for many decades, Ford has conducted durability and reliability testing of its new vehicles before introducing them to the market. This means that Ford trucks, including Plaintiff's Affected Vehicle, are supposed to be exposed to lengthy and comprehensive physical testing that reveals how the vehicles and component parts (including the engines and fuel pumps) will last when driven for tens of thousands of miles.

[39] 2:19-cv-12365-BAF-APP, ECF No. 89-21, PageID.21301-21323, Jan. 20, 2012, Ford Response to NHTSA Inquiry EA11-003, Document titled, "INRD-EA11003-50103P.pdf," available at https://www.nhtsa.gov/recalls?nhtsaId=EA11003 (last accessed July 18, 2023), at 502-547.

99. Through this testing, Ford also would have discovered the defect—before selling Plaintiff's Affected Vehicle. As the driver complaints to NHTSA show,[40] and as the Plaintiff's own experiences iterated herein show, it is not uncommon for the CP4 fuel pump in Plaintiff's Affected Vehicle to fail before the vehicle has even been driven 25,000 miles, with failures as low as 23,000 miles of driving as experienced by Plaintiff. Likewise, it is not uncommon for the CP4 fuel pump in Plaintiff's Affected Vehicle to fail within the first year of driving. These early failures are well within the scope of Ford's durability and reliability testing.

100. Ford should have performed more tests for the CP4 fuel pump used in Plaintiff's Affected Vehicle by using a wide range of fuel. As detailed herein, the lubricity of fuel in real-world conditions varies dramatically in the United States, suggesting it is prudent for vehicles manufacturer to consider worst-case and realistic-case conditions during testing. As a report from Parker Racor, a well-known fuel filter supplier, stated, "the real long term effect on fuel system life is often not adequately considered[,] as much of the engine durability testing performed is done using high quality fuel that doesn't represent the range of fuels seen in the market. Consideration of filtration performance under less than ideal conditions is necessary to develop an acceptable level of protection."[41] Ford never adopted this approach,

[40] *See, e.g., infra* ¶¶ 113-19.

[41] 2:19-cv-12365-BAF-APP, ECF No. 89-9, PageID.20968, Steven Hardison & Adam Pearce, July 2014 Summary of Fuel Injection Equipment with Respect to

and instead asked for fuel with a lubricity target score that was much lower than the level set by EPA regulations.

101. Despite this knowledge, beginning with the 2011 model year Ford was touting the improved durability of its Power Stoke 6.7L engine, which was installed in Plaintiff's Affected Vehicle and incorporated the CP4 fuel pump. Indeed, Ford claimed that the Power Stroke improves durability while increasing fuel injection pressure up to nearly 30,000 psi, increasing noise reduction and also tolerating up to 20% biodiesel fuel mixtures.[42] The Power Stroke continued to use the new lower-volume CP4 fuel injection pump, including but not necessarily limited to the 2011-present MY Ford Power Stroke Super Duty trucks equipped with a 6.7L engine. The CP4 performed terribly from the start, yet Ford put it into more and more engines, including Plaintiff's 2020 MY Power Stroke 6.7L Ford Super Duty truck.

Diesel Fuel Filtration, PARKER RACOR & AVL, Jan. 7, 2015, available at https://www.parker.com/literature/Racor/RSL0194%20Rev%20-%20(TAP_AVL-Fuel-Study-Racor).pdf (last accessed July 13, 2023), at i; *see also id*. at 13 ("Careful monitoring of fuel quality and filter performance is needed to protect sensitive diesel engine injection systems"); *id*. at 29 ("To avoid costly engine and fuel system components damages, advanced multi-stage filtration is recommended"); *id*. at 31 ("Modern high pressure diesel fuel injection systems contain very small internal clearances and are vulnerable to any build-up of deposits on these components…This issue has become a significant concern in the industry").

[42] *See* 2:19-cv-12365-BAF-APP, ECF No. 90-2, PageID.21405, 2011 Ford Super Duty Brochure at 28, available at https://www.auto-brochures.com/makes/Ford/SuperDuty/Ford_US%20SuperDuty_2011.pdf (last accessed July 13, 2023).

102. Further, Ford accepted the fact that U.S. diesel was "out of spec" and chose against hardware changes, acknowledging and rejecting a suggestion from Chevron in November 2009 that "Ford need[s] to change hardware to be more robust instead of counting on the fuel suppliers to improve quality, or ask for tighter lubricity specification."[43]

103. Meanwhile, in 2010, under the leadership of Derrick Kuzak, Ford's group vice president of Global Product Development, Ford advertised that its "new diesel engine will deliver significant improvements in torque, horsepower, and fuel economy while adding more fueling flexibility." For 2011, Kuzak promised, "This all-new diesel engine has been so extensively tested both in the lab and in the real world that we're confident we're giving our customers the most reliable and productive powertrain available today." Ford claimed that the new Power Stroke engine could utilize up to 20 percent biodiesel; however, in order to achieve greater

[43] *See* 2:19-cv-12365-BAF-APP, ECF No. 89-16, PageID.21226, Nov. 13, 2009, email from Chevron Ornite Company OEM & Industry Liaison Jerry C. Wang to Ford employees re: "TLP09-117 Brief Report on HFRR Lubricity Evaluation of Diesel Fuels," submitted by Ford to NHTSA in response to NHTSA ODI Inquiry No. EA11003, part of compilation of Ford fuel pump-related emails in "Appendix G" to Ford's Jan. 20, 2012 NHTSA submission (document titled "INRD-EA11003-50107P"). *See also id.* (emphasis added) (Wang presents another option to Ford, stating, "[T]his is an out of spec fuel issue so there is no need to change hardware and hope fuel quality will improve or ***just accept this as fact of life if the warranty is manageable***").

fuel efficiency, the Power Stroke engine incorporated a newer, lower-volume fuel injection pump, Bosch's CP4 pump.[44]

104. At least as early as 2010, Ford recognized the problem and began looking for ways to blame consumers or fuel supplies for the poor performance of their CP4 pumps;[45] rather than acknowledge the problem to unsuspecting consumers, Ford would point to "fuel contamination," thereby shifting the blame to Plaintiff.[46]

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[44] *See, e.g.*, Ex. 17, "Beware the Scorpion! 2011 Ford Super Duty Gets All-New 6.7-Liter Diesel V8," AUTOBLOG, Aug. 31, 2009, available at https://www.autoblog.com/2009/08/31/beware-the-scorpion-2011-ford-super-duty-gets-all-new-6-7-liter/ (last accessed July 13, 2023); *see also*, 2:19-cv-12365-BAF-APP, ECF No. 89-18, PageID.21236-21238, "A New Era in Ford Diesel Technology for Pickups Starts Now," Ford Social, available at: https://social.ford.com/en_US/story/design/super-duty/a-new-era-in-ford-diesel-technology-for-pickups-starts-now.html (last accessed July 18, 2023).

[45] *See* 2:19-cv-12365-BAF-APP, ECF No. 89-14, PageID.21050, 9/8/2010 Technical Service Bulletin ("TSB") email by Tony Lusardi, Ford Product Concern Engineer for the 6.7L Diesel, available at https://static.nhtsa.gov/odi/inv/2011/INRD-EA11003-50108P.pdf (last accessed July 13, 2023) (" 2008–2011 Super Duty, equipped with the diesel engine that have been filled with gasoline, incorrect diesel fuel or other non-diesel fuels can damage the fuel system components, including the High-Pressure Injection Pump and fuel injectors. Non-recommended fuels and additives do not meet the lubricating, cooling and anti-corrosion properties that is required of the fuel system components.").

[46] *See*, *e.g.*, 2:19-cv-12365-BAF-APP, ECF No. 89-19, PageID.21247, Nov. 23, 2009 email from Ford Diesel Drivability Service Engineer Zachary Baker to Ford Diesel Engine Team Leader Derek McCallister re: "6.4 Pump & Injectors," submitted by Ford to NHTSA in response to ODI Inquiry No. EA11003, part of compilation of Ford fuel pump-related emails in "Appendix G" to Ford's Jan. 20, 2012 NHTSA submission (document titled "INRD-EA11003-50107P"), at 8 (emphasis added) (Baker explaining how to deal with customer warranty claims involving HPFP failures as follows: "In the event that fuel contamination is evident (contaminated fuel, corrosion in the secondary filter housing, rusted injector barrels,

105. In its January 2012 submission to NHTSA, Ford represented the following: "Ford has ensured that the HPFP design in the peer vehicles is compatible with diesel fuels sold in the United States through engine and vehicle testing with the previously referenced diesel test fuels."[47] Ford also represented that, "[d]uring development of the 6.7L engine, Ford . . . addressed the risk of low lubricity fuel by specifying that HPFPs include a 'wear package' that the supplier [Bosch] had developed for pumps that were intended for use in markets where low lubricity fuel was known to be a concern."[48] This "wear package," if even properly or robustly implemented, was clearly ineffective, and there is simply no way that Ford's aforementioned engine and vehicle testing to "ensure[] that the HPFP design . . . is

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etc.), ***and there is a catastrophic fuel system failure with debris in the fuel system***, I will advise the dealer that ***the repair will likely not be covered under warranty due to fuel contamination***"); *id.* at PageID.21241-21242 (emphasis added) (Dec. 2, 2009, email from Ford engineer Scott Eeley to fellow Ford engineers Bob Espinoza, Leon Bergeron, Craig Davis, Scot McDonagh, Carlos Armesto et al. (noting that "[m]ore than 115 ml water in the fuel system is abnormal and indicates excess water in the fuel supply chain. ***Failures caused by non-specified fuel are not covered by Ford Motor Company Warranty—refer to Owners Guide***"); *id.* at PageID.21241 (discussing ways for Ford to "reduce warranty costs" by giving Ford service technicians tips for placing blame on consumers, such as identifying a historical "check engine light" diagnostic trouble code in the customer's vehicle data download which indicates that the customer has "ignore[d] the light [and] they should be held responsible (insurance claim)").

[47] 2:19-cv-12365-BAF-APP, ECF No. 89-10, PageID.21033, Jan. 20, 2012, Ford Response to NHTSA Inquiry EA11-003, Document titled, "INRD-EA11003-50102P.pdf," at 20, available at https://static.nhtsa.gov/odi/inv/2011/INRL-EA11003-50102P.pdf (last accessed July 13, 2023).

[48] *Id.* at PageID.21036.

compatible with diesel fuels sold in the United States" did not show the CP4 pump failing when used with U.S. diesel fuel.

106. The chart below[49] shows CP4 warranty claims based on the Affected Vehicles' months in service as of approximately 2019-2020. This chart is notable in several respects. First, it shows that the defect can manifest at any time, including right after the sale of the vehicle. Second, it shows that the peak in manifestation during a vehicle's service life is around 28-32 months, which is well within the factory warranty period (assuming the drivers did not drive 100,000 miles in two-and-a-half years), and far short of what Bosch represented was the useful life of the pump. This is significant; if the pump did not have an inherently fragile design, the typical pattern of failure would be a small spike in the beginning (for parts that were defectively manufactured or assembled, or "early failures"), then a virtually flat line during the pendency of most of the warranty ("random failures"), then a rise as the warranty period is set to expire ("wear-out failures"). This is known as a "bathtub curve," and it is frequently used in reliability engineering:

[49] *See* 2:19-cv-12365-BAF-APP (E.D. Mich.), ECF No. 87, PageID.19639-19641.

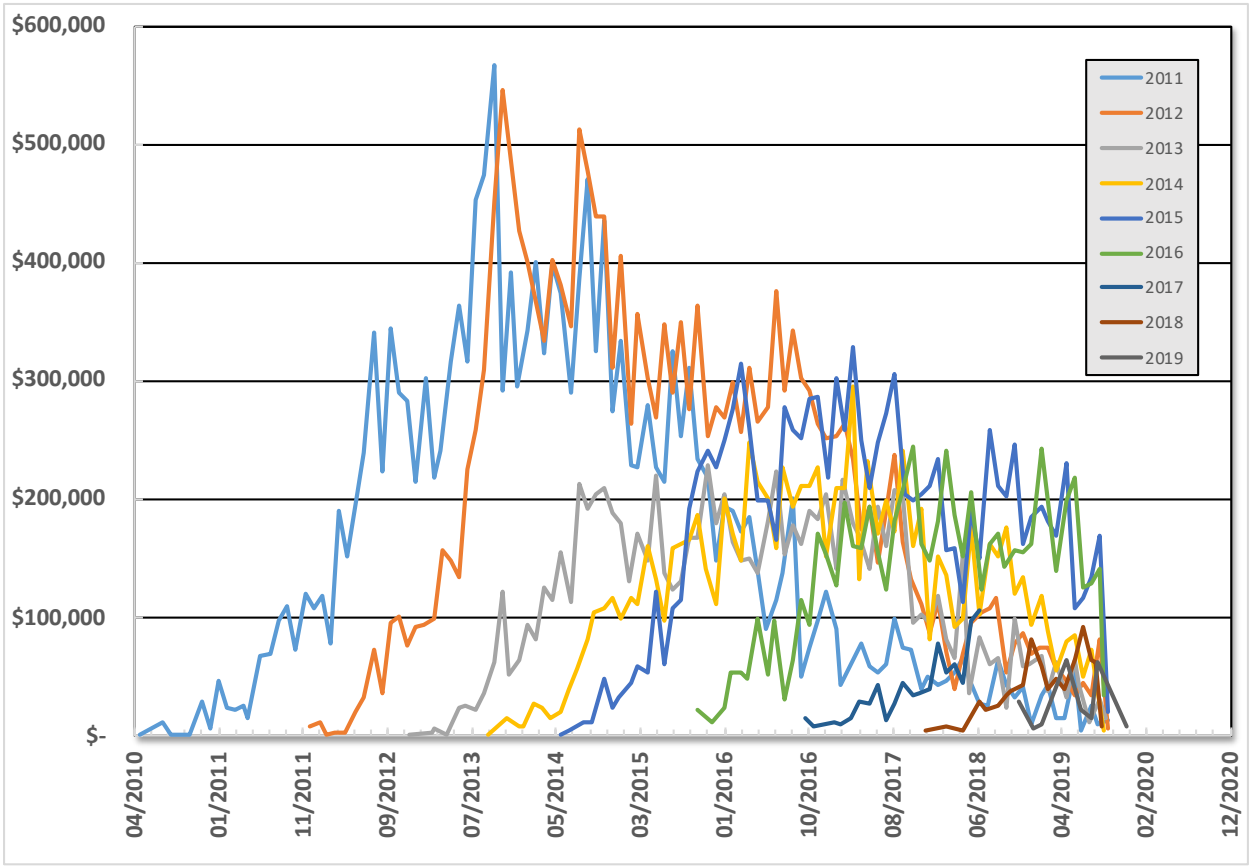

Chart 2: Warranty Claims on Months in Service

H. The CP4 Defect Poses an Inherent Risk to Vehicle Occupant Safety and Renders Plaintiff's Truck Per Se Defective

107. The federal Safety Act and related regulations require the quarterly submission to NHTSA of "early warning reporting" data, including claims relating to property damage received by the automotive manufacturer, warranty claims paid by the automotive manufacturer, consumer complaints, incidents involving injury or death, and field reports prepared by the automotive manufacturer's employees or

representatives concerning failure, malfunction, lack of durability, or other performance issues.[50]

108. The Safety Act further requires immediate action when a manufacturer determines or should determine that a safety defect exists.[51] A safety defect is defined by regulation to include any defect that creates an "unreasonable risk of accidents occurring because of the design, construction, or performance of a motor vehicle" or "unreasonable risk of death or injury in an accident." 49 U.S.C. § 30102(a)(8). Within five (5) days of learning about a safety defect, a manufacturer must notify NHTSA and provide a description of the vehicles potentially containing the defect, including "make, line, model year, [and] the inclusive dates (month and year) of manufacture," a description of how these vehicles differ from similar vehicles not included in the recall, and "a summary of all warranty claims, field or service reports, and other information" that formed the basis of the determination that the defect was safety related.[52] Then, "within a reasonable time" after deciding that a safety issue exists, the manufacturer must notify the owners of the defective vehicles.[53] Violating these notification requirements can result in a maximum civil penalty of $15,000,000.[54]

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[50] 49 U.S.C. § 30166(m)(3); 49 C.F.R. § 579.21.
[51] *See United States v. Gen. Motors Corp.*, 574 F. Supp. 1047, 1050 (D.D.C. 1983).
[52] 49 U.S.C. § 30118(c); 49 C.F.R. § 573.6(b)-(c).
[53] 49 C.F.R. §§ 577.5(a), 577.7(a).
[54] 49 U.S.C. § 30165(a)(1).

109. Importantly, Ford was on notice—and indeed, has repeatedly *admitted*—that the safety risks of moving stalls or "no-starts" such as those associated with the CP4 fuel pump pose an inherent risk to vehicle occupant safety. In August 2016, Ford conducted a safety recall for model year 2015-16 Ford Transit vans equipped with 3.2–liter diesel engines due to "[a] fuel injection pump malfunction" which "may cause the engine to not start or stall without warning and without the ability to restart."[55] Ford further acknowledged that "[a]n engine stall while driving, without warning or the ability to restart can increase the risk of a crash."[56]

110. Based on its duty to monitor safety-related complaints and concerns, Ford assuredly saw ***scores*** of consumer complaints regarding the now-notorious CP4 pump defect.

[55] *See* 2:19-cv-12365-BAF-APP, ECF No. 89-22, PageID.21325-21326, Aug. 22, 2016, Ford Part 573 Safety Recall Report for NHTSA Recall Campaign No. 16V-618, available at https://static.nhtsa.gov/odi/rcl/2016/RCLRPT-16V618-7678.PDF (last accessed July 13, 2023); *see also* 2:19-cv-12365-BAF-APP, ECF No. 89-23, PageID.21329, https://news.pickuptrucks.com/2016/08/recall-alert-2015-2016-ford-transit.html (last accessed July 13, 2023).

[56] 2:19-cv-12365-BAF-APP, ECF No. 89-22, PageID.21325, Aug. 22, 2016, Ford Part 573 Safety Recall Report for NHTSA Recall Campaign No. 16V-618, available at https://static.nhtsa.gov/odi/rcl/2016/RCLRPT-16V618-7678.PDF (last accessed July 13, 2023).

111. For example, on September 21, 2011, the following story was circulated on RV.net by one sorely disappointed owner of a 2011 F-350 6.7L Power Stroke diesel with only 35,000 miles:

> To all my friends here at Rvnet[:]
>
> I see my issues with my fuel system have traveled to Rvnet. I would have started a thread earlier in the saga but have been very busy. This should have been a simple situation to fix. It has turned into a circus.
>
> Here is the link to the story. It has escalated into an epic event:
>
> http://www.ford-trucks.com/forums/1099978-painful-an-update.html
>
> I wanted to know the facts of the failure before I brought the story here. I wanted to keep rampant speculation and unnecessary commentary out of the discussion. It is really an unfortunate turn of events. The cliff's notes version is as follows:
>
> Truck quit like the key was turned off. It was a Saturday[.]
>
> Ford Roadside assistance towed it to the nearest open Ford facility[.]
>
> This dealer began the service work late on Monday morning.
>
> According to them their diagnostics led them to replace the fuel rail pressure sensor. After waiting a day for the part...still no start[.]

According to them, further diagnostics then led them to the fuel injection control module. The part will be in on Friday afternoon and we will get it out the door before we close...wrong again.

There has been no mention of contaminated fuel up to this point. This is a huge deal because fuel samples should have been taken before any fuel system work was attempted. Now the dealer has 3 days of work where he can not recover any warranty money. Anyone see what's coming?

Now the dealership dance starts. They claim fuel contamination and tell me I am paying. On Monday, they contacted the Ford tech hotline with an exaggerated story about water in the fuel.

I called Ford customer care. After 2.5 hours of discussion over the course of Monday afternoon, I was summarily dismissed with the admonition that the bill for the repairs would be mine. My request to talk to an upper level customer service manger was refused.

I removed the truck from the non servicing dealer. I can not tell you how much fun that was. I had it towed 75 miles to my servicing dealer.

They have begun work on the truck. There is no evidence of water penetration beyond the water separator/primary fuel filter. There was less than 2 ounces of water removed from the separator...if that is where it actually was found...they captured the sample in used drinking water bottles. The under hood secondary filter shows no evidence of ever having water in it. The parts they said were damaged with rust have no signs of rust.

The high pressure fuel pump is toast. There is no evidence present showing water contamination...or any other form of contamination.

> Now we wait for the Ford Field Service Engineer . . . . I am not confident at all that this will be resolved in a fashion that makes me whole."[57]

Then, the following day, this same user posted an update, which read as follows:

> Well, another day has slipped by in my ongoing attempt to get my truck fixed under warranty. It has been 12 days since the truck quit. There have been some developments.
>
> First, my dealer has decided that this is unquestionably a warranty repair. His repair and service records on the truck indicate no history of water being found in the separator when they worked on the truck. There can be no long term water presence to do the type of damage that the non servicing dealer tried to claim. Ford technical documents with pictures showing the type of water and rust damage required to void warranty show parts exponentially more damaged than one might expect. My parts show no such damage.
>
> The Ford tech hotline is not cooperating with my dealer. They have refused to send out a Field Service Engineer . . . ."[58]

112. Five years later, this same F-350 owner posts again to his original "Open Roads" enthusiasts forum now that the CP4 issue has gone viral, stating the following (after summarizing his 2011 debacle):

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[57] 2:19-cv-12365-BAF-APP, ECF No. 89-24, PageID.21337-21338, *My Big Ford Drum is Broke*, RV.NET, Sept. 21, 2011, available at http://www.rv.net/forum/index.cfm/fuseaction/thread/tid/25428988.cfm (last accessed July 14, 2023).

[58] *Id.*

> "The real cost to fix this problem, at least with Ford, is over $10,000...my repair was $10,300 . . . and if you do not make these repairs to Ford's specification (replace everything but the tank) the engine warranty is flagged[)]. [S]eeing that Ford does not fix many of them under warranty anyway rends that position moot[.]
>
> "I close this missive with a comment made to me during my Ford ordeal by the lead engineer at Ford for the 6.7 engine project...paraphrasing for brevity...'I was at Bosch the other day. I walked by two pallets full of failed CP4 pump returns...one Ford and one GM...looked about the same size pile of each...'"[59]

113. In a similar vein, on August 1, 2016, the owner of a 2015 Ford F-350 Supercab submitted the following complaint to NHTSA regarding the defective condition:

> "2015 F350 6.7 DIESEL WITH 46,000 MILES THAT IS DOWN BECAUSE [HPFP] IS DEFECTIVE AND SPREADING MEDAL THROUGH SYSTEM. FORD HAS INSPECTED AND SAID IT IS BECAUSE OF WATER IN FUEL, EVEN THOUGH NO WARNING LIGHTS OR CODES ARE AVAILABLE. FORD PULLED SENSORS OUT OF ENGINE AND REJECTED REPAIR BECAUSE OF TARNISH ON SENSORS. THE ONLY CODES WERE FOR (LOW FUEL PRESSURE & REDUCED POWER). NO OTHER CODES. INITIAL INSPECTION REVEALED ABOUT 3/4 INCH OF WATER IN WATER SEPARATOR BUT NO LIGHT OR CODE. THE WARNINGS OCCURRED WHEN TRUCK WAS STARTED AND IT RAN ABOUT

[59] 2:19-cv-12365-BAF-APP, ECF No. 89-25, PageID.21348-21349, *2011 Duramax and up fuel pump problems*, OPEN ROADS FORUM, Jan. 22, 2016, available at https://www.rv.net/forum/index.cfm/fuseaction/thread/tid/28726814/srt/pa/pging/1/page/2.cfm (last accessed July 14, 2023) (ellipses in original).

> 100 FT BEFORE BEING SHUTDOWN AND TOWED TO DEALERSHIP. THIS APPEARS TO BE A COMMON PROBLEM SINCE FORD OFFERS A REPAIR KIT FOR THIS ISSUE. TOTAL COST OF REPAIR IS BETWEEN $9500,00 & $12,500 DOLLARS AND THIS ON A TRUCK WHICH IS STILL UNDER WARRANTY THAT FORD WILL NOT HONOR. THE TRUCK WASN'T A YEAR OLD UNTIL MAY 2016 AND HAS BEEN DOWN FOR OVER FOUR MONTHS BECAUSE FORD WILL NOT REPAIR. THIS IS THE BOSCH C4 SERIES PUMP. *BF *TR"[60]

114. On October 8, 2021, the owner of a 2020 F-350 Super Duty posted the following on a Ford Truck enthusiasts forum:

> "My truck has 27,000 mile, 6.7 diesel 2020 F-350 limited. While driving it one day the engine light came on and said to reduce engine speed. It throttled me down to 30 mph and as soon as I pulled off the road the truck died and wouldn't start again. Dealer broke it down and said there was rust on the high pressure fuel pump and metal shavings broke off in the system and that the entire fuel system has to be replaced and that the warranty won't cover it and the dealer quoted me $15,000. However, when they took a fuel sample from the tank they didn't see any traces of water in it. They stated that sometimes a very small amount (a drop or two) of water can get caught in the system and bypass the water separators and cause this problem and it probably the small amount of water worked itself out of the system already?????? Then why is this not covered under warranty the water separator is not doing it's job?"[61]

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[60] NHTSA ID No. 10892303.

[61] Ex. 18, *2020 F-350 DRW Limited / Water Separator Issue*, FORD TRUCK ENTHUSIASTS FORUM, Oct. 8, 2021, at 1-2, available at https://www.ford-trucks.com/forums/1676206-2020-f-350-drw-limited-water-separator-issue.html (last accessed July 14, 2023).

115. On December 18, 2021, the owner of a 2020 F-250 Power Stroke posted the following on a Ford Truck enthusiasts forum:

> I owned a custom ordered, brand new 2020 F250 Lariat Tremor with 6.7L Turbodiesel that I took deliver of in February 2020. It lasted 5 months and 7490 miles before the fuel pump detonated, stalling the truck while in motion and in the middle of Friday evening, 5-o'clock traffic. I barely managed to get the truck out of traffic without an accident. It took Ford 88 days to fix my truck . . . .[62]

116. Similarly, on January 10, 2022, the owner of a 2019 F-350 Super Duty Power Stroke posted the following on PowerStroke.org:

> I have a 2019 f350 with a 6.7, 24000 miles, the other night I got the reduced engine power (a CEL p0088) the truck died on the side of the road. I took it to the dealer and they are telling me that my fuel pump died because the fuel gelled. The failure will not be covered under warranty. They are telling me it is going to cost $12684.65 to repair the complete fuel system.[63]

117. Indeed, Ford is notorious for blaming consumers for this catastrophic failure and blatantly refusing to take responsibility for its own defective vehicle design. By way of example, see the following non-exhaustive list of complaints that

[62] Ex. 19, *2022 6.7 Power Stroke and CP4 Issue*, FORD TRUCK ENTHUSIASTS FORUM, Dec. 18, 2021, at 6-7, available at https://www.ford-trucks.com/forums/1677602-2022-6-7-power-stroke-and-cp4-issue.html (last accessed July 14, 2023).

[63] Ex. 20, *Another CP4 Fuel Pump*, POWERSTROKE.ORG, Jan. 10, 2022, available at https://www.powerstroke.org/threads/another-cp4-fuel-pump.1391834/ (last accessed July 14, 2023).

consumers have filed with NHTSA regarding the same exact CP4-fueled issue occurring over and over again in Ford diesel vehicles:

- Mar. 21, 2014, 2013 Ford F-250 Supercab customer complaint filed with NHTSA:

  "HAD CHECK ENGINE LIGHT COME ON. BROUGHT TO FORD SERVICE 3 TIMES. THE LAST TIME THEY QUOTED ME 11,145 TO FIX SAYING WATER WAS IN FUEL. I THOUGHT IT WAS UNDER WARRANTY, WHICH THEY CLAIM IT IS NOT. MY INSURANCE COMPANY SENT BY AN ENGINEER, WHICH HE SENT FUEL TO INDEPENDENT LAB. FUEL RESULTS CAME BACK NEGATIVE FOR EXCESSIVE FUEL. TRUCK HAS BEEN AT SERVICE CENTER FOR 1 MONTH, WITH NO RESULTS. *TR"[64]

- Jan. 9, 2014, 2013 Ford F-250 Supercab customer complaint filed with NHTSA:

  "VEHICLE STALLED AND STOPPED RUNNING IN TRAFFIC ON HIGHWAY 231 IN MONTGOMERY AL. . . . CALLED FORD ROADSIDE ASSIST. I HAVE 125K EXTENDED WARRANTY AND HAD VEHICLE TOWED TO NEAREST FORD DEALERSHIP . . . . VEHICLE WAS DIAGNOSED WITH 'EVIDENCE OF WATER IN FUEL SYSTEM[.'] THERE WAS NO WATER PRESENT IN SYSTEM, NO 'WATER IN FUEL SYSTEM' WARNING LIGHT HAS [EVER] LIT UP ON THIS VEHICLE, HAD IT CHECKED IN THE PAST, WAS TOLD WAS FUNCTIONAL, WAS TOLD REPAIRS WERE 'NOT COVERED' . . . . THE REPAIRS ARE MORE THAN I CAN AFFORD FOR A TRUCK THAT IS UNDER WARRANTY. THIS IS CLEARLY A SYSTEM FAILURE. *TR"[65]

[64] NHTSA ID No. 10576017.
[65] NHTSA ID No. 10559221.

- Feb. 12, 2014, 2011 Ford F-350 Supercrew customer complaint filed with NHTSA:

  "THE ENGINE LIGHT CAME ON TODAY IN MY 2011 F350 DIESEL. DEALER SAYS DEF PUMP ERROR CODE. DEALER SAYS NO PUMPS AVAILABLE UNTIL 03/15/2014. I THINK FORD SHOULD ISSUE A SERVICE BULLETIN. DEALER SAYS NO WARRANTY. DEALER STATES TRUCK WILL SHUT DOWN AT ANY TIME. THIS SHOULD BECOME A RECALL ISSUE WITH THE NHTSA. OWNERS OF THESE TRUCKS TOW TRAILERS FREQUENTLY WITH LENGTHS IN EXCESS OF 36'. HAVING A TOW VEHICLE SHUT DOWN IN TRAFFIC AT HIGHWAY SPEEDS IS EMINENTLY DANGEROUS AND WILL CAUSE FATALITIES REFER TO NHTSA CAMPAIGN NUMBER: 13V535000 ON SIMILAR VEHICLES. *TR"[66]

- May 23, 2014, 2011 Ford F-350 Supercrew customer complaint filed with NHTSA:

  "THIS DIESEL TRUCK WAS BEING DRIVEN AT 20 MPH WHEN WITHOUT ANY WARNING, THE ENGINE SHUT OFF RESULTING IN LOSS OF ALL POWER STEERING AND BRAKES. WOULD NOT RESTART. TOWED TO DEALER SERVICE. DEALER DIAGNOSED LACK OF FUEL PRESSURE AND THEY OBSERVED METAL SHAVINGS IN THE LOWER FILTER INDICATING THE HPFP WAS DISINTEGRATING. DEALER SUBMITTED PICTURES OF THE FLOW CONTROL VALVE TO FORD WARRANTY PRIOR APPROVAL PER SERVICE MANUAL DIRECTIONS. DEALER OBSERVATION WAS THAT THEY OBSERVED NO SIGNIFICANT WATER OR DEBRIS CONTAMINATION IN THE FUEL FILTER. PRIOR APPROVAL RESPONSE WAS THAT THE PICTURES SUBMITTED WERE REPRESENTATIVE OF FUEL

[66] NHTSA ID No. 10563967.

> CONTAMINATION AND DENIED THE WARRANTY COVERAGE FOR THE REPAIR. NO WATER IN FUEL INDICATION WAS EVER SEEN BY OWNER. FILTERS MAINTAINED PER MAINTENANCE SCHEDULE. BILL FOR REPAIR IS ESTIMATED AT APPROX $11,000.
> "TWO WEEKS PRIOR, THIS VEHICLE WAS TOWING A 14K LB 5TH WHEEL DOWN THE SANTIAM PASS IN OREGON. STEEP INCLINES, SHARP DROP OFFS, AND SNOW ON THE ROAD. A SUDDEN LOSS OF POWER WITHOUT WARNING WOULD VERY LIKELY HAVE RESULTED IN LOSS OF CONTROL OF THE VEHICLE, SEVERE BODILY INJURY, OR DEATH. IT APPEARS THE BOSCH CP4 FUEL PUMP WAS NOT DESIGNED TO OPERATE WITH THE 560 SCAR FUEL LUBRICITY OF US FUELS AND THAT FORD IS BLAMING PUMP FAILURES ON WATER CONTAMINATION BY OBSERVATION OF A CORROSION APPEARANCE ON ANOTHER COMPONENT. WARRANTY COVERAGE WAS DENIED WITHOUT ANY OBSERVATION OF THE FUEL PUMP ITSELF. NOTE THAT NO INDICATION THAT ANYTHING WAS WRONG WITH THE TRUCK WAS OBSERVED PRIOR TO THE FAILURE. THE TRUCK IS EQUIPPED WITH A FACTORY 5TH WHEEL HITCH AND IS INTENDED TO HAUL UP TO 21.5K LB TRAILERS. SUDDEN LOSS OF POWER STEERING AND BRAKES WITHOUT WARNING UNDER THIS INTENDED USE IS EXTREMELY DANGEROUS. *TR"[67]

- Aug. 14, 2014, 2013 Ford F-350 Supercrew customer complaint filed with NHTSA:

> "I WAS DRIVING IN MY NEIGHBORHOOD AT ABOUT 25 MPH AND THE ENGINE QUIT, AND WOULD NOT RESTART!! [. . .] THE TRUCK HAD TO

[67] NHTSA ID No. 10593571.

> BE TOWED TO THE DEALER AND IT HAS [BEEN] THERE FOR OVER A WEEK AND THEY CALLED YESTERDAY AND TOLD ME THERE WERE METAL SHAVINGS IN THE FUEL PUMP AND I DO NOT KNOW IF THE METAL SHAVINGS GOT INTO THE OIL SYSTEM TO RUIN THE ENGINE!! *TR"[68]

- Dec. 9, 2014, 2012 Ford F-250 Supercrew customer complaint filed with NHTSA:

> "TL* THE CONTACT OWNS A 2012 FORD F-250 SD. THE CONTACT STATED THAT WHILE DRIVING APPROXIMATELY 63 MPH, THE REDUCED POWER AND THE CHECK ENGINE WARNING LIGHTS ILLUMINATED. THE VEHICLE WAS TOWED TO A SECOND DEALER, WHO DIAGNOSED THAT THERE WAS AN UNKNOWN SUBSTANCE IN THE FUEL TANK. THE VEHICLE WAS NOT REPAIRED . . . . THE APPROXIMATE FAILURE MILEAGE WAS 18,877."[69]

- March 8, 2019, 2017 Ford F-250 Power Stroke customer complaint filed with NHTSA:

> WITH NO NOTICE THE TRUCK CUT OFF AT A BUSY INTERSECTION AND WOULD NOT RESTART. BECAUSE OF THE LOCATION THE POLICE ORDERED A TOW TO MOVE IT QUICKLY. LATER ROADSIDE ASSISTANCE TOWED IT TO THE DEALER WHO INFORMED ME THE FUEL PUMP WAS BAD BUT THEY REQUIRED MORE THROUGH WORK TO QUOTE IT ALL. IT ENDED UP THE WHOLE HIGH PRESSURE FUEL SYSTEM HAD TO BE REPLACED AS WELL AS THE FUEL INJECTORS. FORD CLAIMED IT WAS DUE TO WATER CONTAMENATED FUEL HOWEVER MY

[68] NHTSA ID No. 10622326.
[69] NHTSA ID No. 10663076.

> INSURANCE SENT A SAMPLE PULLED FROM THE TRUCK AND FOUND ONLY METALS CONSISTENT WITH THE MATERIAL FOUND IN THE FUEL SYSTEM BUT NO WATER. MY INTERNET RESEARCH SHOWED RECALLS FOR THIS TRUCK WERE ISSUED FOR A MISSING STRAP ON THE FUEL PUMP BUT NOT FOR MY VIN WHICH WAS PRODUCED IN THE KENTUCKY PLANT. WHEN I SHOWED THE DEALERSHIP THEY ENCOURAGED ME TO CONTACT FORD CORPORATE AS THEY COULD NOT ASSIST ME FURTHER. THE TRUCK SHUTTING OFF WITH NO WARNING IS A DANGER TO THE DRIVER. I WAS BILLED $9,493.49 BECAUSE THEY CLAIMED WATER CONTAINATION IN THE FUEL WHICH WAS NOT PRESENT. I HAD THE DEPARTMENT OF AGRICULTURE CHECK THE LAST PLACED I PURCHASED FUEL AND IT WAS ALSO FINE AS WAS THE FUEL THE INSURANCE COMPANY PULLED FROM THE TRUCK. FORD OWES THE CONSUMER A RECALL AND REINBURSEMENT FOR THE CHANGES! THIS HAPPENED TO BE THE 2ND FUEL SYSTEM THIS TRUCK HAS RECEIVED. . . .[70]

- Aug. 28, 2020, 2020 Ford F-250 Supercrew customer complaint filed with NHTSA:

> "ON AUGUST 28, 2020, THE ENGINE IN MY VIRTUALLY BRAND NEW 2020 FORD F-250 TRUCK (EQUIPPED WITH A DIESEL ENGINE) SUDDENLY AND WITHOUT ANY ADVANCED WARNING WHATSOEVER SHUT OFF WHILE THE VEHICLE WAS IN MOTION. I HAD JUST TURNED FROM STATE HIGHWAY 10 INTO THE LEFT LANE OF A FOUR-LANE CITY STREET IN 5 O'CLOCK TRAFFIC ON A FRIDAY EVENING. WITHOUT EITHER POWER BRAKES OR POWER STEERING, I WAS ABLE TO

[70] NHTSA ID No. 11185429.

> GET THE TRUCK OUT OF THE ROADWAY AND INTO THE PARKING LOT OF AN ADJACENT BUSINESS. I TRIED TO RESTART THE VEHICLE NUMEROUS TIMES. WHILE THE ENGINE WOULD CRANK, IT SIMPLY WOULD NOT RESTART. I CONTACTED MY LOCAL FORD DEALERSHIP THE NEXT MORNING AND THEY ARRANGED TO HAVE THE TRUCK TOWED TO THEIR PLACE OF BUSINESS. AFTER THE FORD DEALERSHIP HAD MY TRUCK FOR NEARLY A MONTH, THEY DETERMINED THAT THE CAUSE FOR THE SUDDEN SHUTDOWN OF MY ENGINE WAS A FAILED BOSCH CP4 HIGH PRESSURE FUEL PUMP, WHICH FAILURE CONTAMINATED MY ENTIRE FUEL DELIVERY SYSTEM WITH METAL SHAVINGS. I AM NOW AWARE THAT THERE ARE CLASS ACTION LAWSUITS AGAINST EACH OF THE MAJOR US MANUFACTURERS RELATING TO FAILURES OF THE BOSCH CP4 HIGH PRESSURE FUEL PUMP AS A RESULT OF THE LACK OF LUBRICATION PROVIDED BY LOW-SULFUR DIESEL FUEL GENERALLY AVAILABLE IN THE US, WHICH FAILURES RESULT IN SUBSTANTIAL REPAIR COSTS TO REPLACE THE ENTIRE FUEL DELIVERY SYSTEM."[71]

- Feb. 18, 2022, 2020 Ford F-250 Supercab customer complaint filed with NHTSA:

> "Going down road cruise set in a 4 lane heavy traffic my truck dies like a light comes on and cars are bumper to bumper I'm trying to pull over my children are in the vehicle they go to crying scared finally I got half way off the road and got out and with few good peoples help pushed it out of the road I switched on and off the truck I could hear the pump near the tank making all kinds of noises I new then my fuel pump had went out."[72]

[71] NHTSA ID No. 11376143.
[72] NHTSA ID No. 11452800.

118. Because Plaintiff's Affected Vehicle has an inherent safety defect (as evidenced by the customer complaints cited herein), Plaintiff has been economically injured, because a vehicle which later turns out to have a safety defect is clearly worth less than it was at the point-of-sale while the defect was still being concealed.

I. The Cost and Damage from "Progressive" CP4 Failures are Significant

119. In addition to catastrophic CP4 failure, there are harmful consequences from the progressive failure that the pump exhibits. Early symptoms of progressive failure of the Bosch CP4 pump include malfunction and failure of the precision common rail fuel injectors. Microscopic metal debris from the CP4 pump may slop past the filter in the metering valve and into the pumping chambers of the CP4 pump, and then flow out to the downstream fuel pipes, fuel rails, and to the injectors, thereby contaminating the whole fuel system with microscopic debris. The openings in the injectors are very small (a few microns), and microscopic pump wear debris can either hold the injector nozzle needle open, or closed, or slow its opening and closing rate.

120. If the injector nozzle needle is left open too long or stuck open, this will result in gross over-fueling of the combustion chamber, which can lead to progressive damage of the power cylinder (including the piston, rings, block, connecting rod, and crankshaft). Over-fueling can overheat the piston and result in

a twisted or melted piston, or burn a hole in the piston. Over-spray penetration can also result in dilution of the lube oil on the power cylinder walls and lead to scuffing and eventual failure of the piston, connecting rod, and the engine block. Sever dilution of the lube oil can also damage engine and rod main bearings and other oil-lubed running surfaces.

121. A stuck or sticking injector which causes over-fueling can also increase fuel consumption and thereby reduce fuel economy. The air-fuel ratio of modern diesels is 18 parts air to one part fuel or higher (18:1—70:1 or what is called "lean burn") for optimal combustion. But when the injectors are sticking open or blocked open, the fueling becomes uncontrolled (by the electronic control unit) and air/fuel ratios can become much richer than design calibration. This increases the potential for white smoke (unburned fuel), black smoke (burned but wasted fuel), combustion pressures, and temperatures and emissions (NOx, particulate matter, CO, CO2, and unburned hydrocarbons) beyond capabilities of exhaust after-treatment systems to control. Fuel economy will also likely decline since the wasted fuel to produce the smoke is not doing work to produce power, and so miles per gallon should be reduced.

122. In addition, a blocked closed injector (due to wear debris) forces the engine control system to demand more fueling from the remaining functional

injectors to compensate for the loss of a power cylinder, and this can also cause reduced performance and increased fuel consumption/reduced fuel economy.

123. In some cases, injector nozzle tips can be broken by wear debris trapped in spray holes or under the nozzle needle seat, essentially turning the injector into an open fuel hose. A broken nozzle tip can result in gross over-fueling which may cause hydraulic lock[73] and bending of the connecting rods. Over-fueling also causes over-temperature conditions which can damage exhaust valves, cylinder heads, exhaust manifolds, turbochargers and after-treatment systems. These progressive damages can occur before the CP4 pump catastrophically fails, and causes noticeable loss of fuel pressure warnings, engine stall, or no start conditions which forces the consumer to seek a repair and pump replacement. Fuel systems contaminated with microscopic wear debris must be completely replaced including fuel pressure pipes, rails and pressure sensors and injectors.

124. In short, Plaintiff's Affected Vehicle is inherently less durable than previous models because of the CP4 fuel pump defect. Less durability led to Plaintiff's enormous repair costs.

[73] "Hydraulic lock" refers to a condition when the piston hits solid fuel, rather than air or a fuel/air mix.

125. The Bosch CP4 Pump problem is so prevalent that several automotive parts sellers now provide kits to mitigate the inevitable harm.[74] "CP4 Disaster Prevention Kits" or "bypass kits" usually refer to a fuel bypass system that does not prevent the failure, the loss of the expensive injection pump, or the need to clean metal shavings from the fuel system. But these kits are designed to redirect the lubricating fuel for the CP4 back to the fuel tank, so that it will be filtered before it returns to the engine. The bypass kit directs the fuel contaminated with metal shavings into the gas tank, which is less expensive to clean than the engine and high-pressure fuel system—in other words, a Band-Aid solution. These bypass kits are also less expensive than more complete remedies, requiring only $300-$400 in parts, and are marketed as having the ability to "prevent the contamination from the failure from entering the high pressure fuel system."[75]

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[74] *See, e.g.*, 2:19-cv-12365-BAF-APP, ECF No. 91-6, PageID.23447-23448, online sales listing for "CP4 Disaster Prevention Kit 11-16 6.7L Ford Powerstroke," DieselPowerProducts.com, available at https://www.dieselpowerproducts.com/p-17545-grp-cp4-disaster-prevention-kit-11-16-67l-ford-powerstroke.aspx (last accessed July 14, 2023); 2:19-cv-12365-BAF-APP, ECF No. 91-7, PageID.23454-23455, online sales listing for "XDP CP4 Disaster Prevention Kit – 6.7L Powerstroke 2011-2019," FullForceDiesel.com, available at https://shop.fullforcediesel.com/xdp-cp4-bypass (last accessed July 14, 2023); 2:19-cv-12365-BAF-APP, ECF No. 91-8, PageID.23460, online sales listing for "XDP 6.7L Powerstroke CP4 Bypass Kit XD282," XtremeDiesel.com, available at https://www.xtremediesel.com/xdp-67l-powerstroke-cp4-bypass-kit-xd282 (last accessed July 14, 2023).

[75] 2:19-cv-12365-BAF-APP, ECF No. 91-9, PageID.23463-23464, Online sales listing for "6.7L Ford Powerstroke 'Disaster Prevention Kit' (CP4 Bypass Kit),"

126. A purported "remedy" is to leave the CP4 in place, but install a lift pump, a second pump to assist the Bosch CP4 Pump and increase the fuel pressure.[76] But, again, this (pseudo-)fix deprives Plaintiff of the fuel-efficiency for which they paid a premium, and is not available on Ford-engine vehicles.

127. The lift pump and CP3 pump options remedy part of the problem by pumping and burning more fuel. So, in addition to the expense of buying a new fuel injection pump, the "remedies" would require owners to purchase more fuel.

128. A fourth way to mitigate the damage is to spend money for fuel additives to increase the lubricity of the fuel. This approach may work best in conjunction with the previously discussed modifications, but even by itself, it can be expensive.

129. In short, there is no known way to remedy or mitigate CP4 pump failure without decreasing the fuel efficiency promised to Plaintiff and without significant expense to Plaintiff.

AccurateDiesel.com, available at https://www.accuratediesel.com/6-7l-powerstroke-disaster-prevention-kit.html (last accessed July 14, 2023).

[76] *See, e.g.*, Ex. 21, M. McGlothlin, "Save $10K on Your LML Duramax Diesel Engine: Install a Lift Pump," DrivingLine.com, available at https://www.drivingline.com/articles/save-10k-on-your-lml-duramax-diesel-engine-install-a-lift-pump/ (last accessed July 14, 2023).

J. Ford Knew Durability and Superiority Were Material to Consumers, including Plaintiff, and Falsely Promised its Trucks Were Durable and Superior

130. Ford has represented ***in every single one of its television advertisements*** that Ford Super-Duty vehicles are fit for driving on American roadways, by featuring Plaintiff's Affected Vehicle ***driving on American roadways***. For example, in its 2015 "Ford Super Duty Challenge" television advertisements, numerous Ford diesel trucks are seen traversing all sorts of American terrain as if they are all adequately drivable and compatible with American diesel fuel:[77]

[77] 2015 "Ford Super Duty Challenge" Television Advertisement, available at https://www.ispot.tv/ad/7icj/2015-ford-super-duty-super-duty-challenge (last accessed July 14, 2023).

131. Literally, every single Ford advertisement featuring the Affected Vehicles falsely demonstrates that these vehicles are compatible with American fuel, ***but they are not.***

132. For its 2020 model year 6.7L diesel Power Stroke Super Duty vehicles, Defendant advertised that Ford's "proven Power Stroke diesel" has "[e]xcellent throttle response is delivered in part by a 36,000-psi fuel-injection system . . . . In this high-pressure environment, new forged-steel pistons provide higher firing pressure capability and less friction for improved durability."[78] This is, of course, at the (hidden) cost of the CP4 high-pressure fuel injection pump, which is prone to catastrophic failure – something which Ford did *not* advertise prior to Plaintiff's purchase.

133. Another example is in Ford's 2016 Super Duty brochure, Ford touted its 6.7L Power Stroke diesel trucks by proclaiming that, "**Best-in-class diesel fuel economy** is maintained with the help of high-pressure fuel injectors that achieve a clean, efficient burn" – and once again, the vehicle is shown *driving* in this *American* advertisement:[79]

[78] *See* Ex. 22, 2020 Ford Super Duty Brochure, https://cdn.dealereprocess.org/cdn/brochures/ford/2020-superduty.pdf, at 4 (last accessed July 14, 2023).

[79] 2:19-cv-12365-BAF-APP, ECF No. 90-7, PageID.21520, 2016 Ford Super Duty Brochure, at 4, available at https://cdn.dealereprocess.org/cdn/brochures/ford/2016-f350superduty.pdf (last accessed July 14, 2023).

134. What consumers should *actually* imagine is their vehicles going into limp mode or full-on stalling while driving on fast-paced, high-traffic freeways.

135. In addition, Ford provided an express five-year/100,000-mile limited warranty for Plaintiff's Affected Vehicle[80]—a warranty that Ford failed to uphold.

136. Ford also represented to Plaintiff that the 2020 6.7L Power Stroke diesel engine was capable of operating on fuels containing up to 20% biodiesel, also

[80] *See*, *e.g.*, *id.* at 24.

known as B20,[81] despite Ford's and the entire automotive industry's knowledge of the corrosive effects on high-pressure fuel injection system parts such as the CP4

[81] *See, e.g.*, *id.* at 4 ("this ***B20-capable engine*** is the most tested Power Stroke diesel ever") (emphasis added); *see also* Ex. 23, Excerpt from 2020 Ford Super Duty Owner's Manual, Section entitled, "Fueling and Refueling: FUEL QUALITY—DIESEL," available at https://www.fordservicecontent.com/Ford_Content/Catalog/owner_information/2020-Ford-F250-F350-F450-F550-F600-Owners-Manual-version-1._om_EN_10_2019.pdf (last accessed July 14, 2023); Ex. 24, Excerpt from 2019 Ford Super Duty Owner's Manual, Section entitled, "Fueling and Refueling: FUEL QUALITY—DIESEL," at 184, available at http://www.fordservicecontent.com/Ford_Content/Catalog/owner_information/2019-Ford-F-250_350_450_550-owners-manual-version-1_om_EN-US_05_2018.pdf (last accessed July 14, 2023); 2:19-cv-12365-BAF-APP, ECF No. 90-10, PageID.21797, 2018 Ford Super Duty Owner's Manual, Section entitled, "Fueling and Refueling: FUEL QUALITY—DIESEL," at 189, available at http://www.fordservicecontent.com/Ford_Content/Catalog/owner_information/2018-Ford-250-350-450-450-Owners-Manual-version-1_om_EN-US-EN-CA_10_2017.pdf (last accessed July 14, 2023) ("You should use Ultra-Low Sulfur Diesel fuel (also known as ULSD) designated as number 1-D or 2-D with a maximum of 15-ppm sulfur in your diesel vehicle"); 2:19-cv-12365-BAF-APP, ECF No. 90-11, PageID.22452, 2017 Ford Super Duty Owner's Manual, Section entitled, "Fueling and Refueling," at 188, available at http://www.fordservicecontent.com/Ford_Content/Catalog/owner_information/2017-Super-Duty-Owners-Manual-version-1_om_EN-US_06_2016.pdf (last accessed July 14, 2023) (stating same); 2:19-cv-12365-BAF-APP, ECF No. 90-12, PageID.22917, 2016 Ford 6.7 Power Stroke Owner Manual Diesel Supplement, Section entitled, "Fuel and Refueling," at 16, available at http://www.fordservicecontent.com/ford_content/catalog/owner_information/2016-ford-6.7l-diesel-f-250-550-supplement-version-1_60l6d_en-us_04_2015.pdf (last accessed July 14, 2023) ("You may operate your vehicle on diesel fuels containing up to 20% biodiesel, also known as B20"); 2:19-cv-12365-BAF-APP, ECF No. 90-13, PageID.23005, 2015 Ford 6.7 Power Stroke Owner Manual Diesel Supplement, Section entitled, "Fuel and Refueling," at 18, available at http://www.fordservicecontent.com/Ford_Content/Catalog/owner_information/2015-Ford-6.7L-Diesel-F-250-550-Supplement-version-1_60l6d_EN-US_02_2014.pdf (last accessed July 14, 2023) (stating same); 2:19-cv-12365-BAF-APP, ECF No. 91-

fuel pump,[82] and provided further directions for which diesel fuel to use if *not* in North America—indicating Ford's obvious expectation that the Affected Vehicle would be filled with American diesel fuel.

1, PageID.23097, 2014 Ford 6.7 Power Stroke Owner Manual Diesel Supplement, Section entitled, "Fuel and Refueling," at 17, available at http://www.fordservicecontent.com/Ford_Content/catalog/owner_guides/1460l6d1e.pdf (last accessed July 14, 2023) (stating same); 2:19-cv-12365-BAF-APP, ECF No. 91-2, PageID.23178, 2013 Ford 6.7 Power Stroke Owner Manual Diesel Supplement, Section entitled, "Fuel and Refueling," at 15, available at https://dmna.ny.gov/nynm/manuals/Ford_F_350_Owners_Manual_2013_Diesel_Supplement.pdf (last accessed July 14, 2023) (stating same); 2:19-cv-12365-BAF-APP, ECF No. 91-3, PageID.23280-23281, 2012 Ford 6.7 Power Stroke Owner Manual Diesel Supplement, Section entitled, "Maintenance and Specifications," at 21-22, available at http://www.fordservicecontent.com/Ford_Content/catalog/owner_guides/1260l6d1e.pdf (last accessed July 14, 2023) (stating same); 2:19-cv-12365-BAF-APP, ECF No. 91-4, PageID.23374, 2011 Ford 6.7 Power Stroke Owner Manual Diesel Supplement, Section entitled, "Maintenance and Specifications," at 21-22, available at http://www.fordservicecontent.com/Ford_Content/catalog/owner_guides/1160l6d1e.pdf (last accessed July 14, 2023) (stating same).

[82] *See, e.g.*, Ex. 25, "Compatibility of Biodiesel with Petroleum Diesel Engines," Feb. 2010, DieselNet.com, available at https://dieselnet.com/tech/fuel_biodiesel_comp.php (last accessed July 14, 2023) (noting that biodiesel's effects on fuel injection equipment such as the CP4 fuel pump can "cause a significant deterioration" of such fuel system components); *id.* (noting "Manufacturers' Position" that "[a]ged or poor quality biodiesel fuel . . . can attack many fuel system components by reducing the service life of fuel injection equipment"); Ex. 26, https://www.fordtremor.com/threads/b20-fuel-doing-any-harm.5340/, at 5 (Ford consumer complaint stating, "I used the B20 fuel for the first time on August 2021. I have a 2020 F350. My truck is now in the local Ford dealer shop. Full replacement of fuel system. $13890. WOW ? Waiting for parts...").

137. Ford has refused to honor its warranties, claiming that the metal shavings caused by the failures of their pump design voided the warranty because they also caused fuel contamination.

138. In short, Ford induced Plaintiff to pay a premium for increased durability, performance and fuel efficiency, with a design it has long known would cause fuel contamination—a condition Ford now uses to absolve itself of the catastrophic and costly consequences to Plaintiff.

V. TOLLING OF THE STATUTE OF LIMITATIONS

139. As of the date of this Complaint, Ford continues to market the Affected Vehicles based on the "Built Ford Tough" motto and claims of superior durability, performance, and fuel efficiency, despite its knowledge that Plaintiff's Affected Vehicle is defective and has failed—in fact, Ford still has not disclosed and continues to conceal that Plaintiff's Affected Vehicle is defective, particularly incompatible with American diesel fuel, and will experience catastrophic and/or progressive CP4 fuel pump failure.

140. Within the time period of any applicable statutes of limitation, Plaintiff could not have discovered through the exercise of reasonable diligence that Ford was concealing the conduct complained of herein and misrepresenting the defective nature of Plaintiff's Affected Vehicle.

141. As pleaded herein, Ford knew of and failed to disclose a major, inherent product defect, and thus any imposition of "durational limitations" on the warranty breaches or claims alleged herein constitute "overreaching," and therefore any such durational limitations are unconscionable. When a manufacturer or seller is aware that its product is inherently defective, but the buyer has no notice of or ability to detect the problem, there is perforce a substantial disparity in the parties' relevant bargaining power. In such a case, Plaintiffs' acceptance of any limitations on his/her contractual remedies, including any warranty disclaimers, cannot be said to be "knowing" or "voluntary," and thereby renders such limitations unconscionable and ineffective. Ford's superior knowledge of the CP4 defect over the weaker-situated Plaintiff demonstrates that the underlying vehicle transaction involved elements of deception such that there was significant unconscionability in the bargaining process, and any durational limitations that Ford may purport to assert on Plaintiff's claims are unconscionable as a matter of law.

142. Further, Plaintiff did not discover, and did not know of, facts that would have caused a reasonable person to suspect that Ford did not report information within its knowledge to Plaintiff or relevant authorities; nor would a reasonable and diligent investigation have disclosed that Ford was aware of the non-conforming and defective nature of the CP4 fuel pump and Plaintiff's Affected Vehicle in which it was incorporated.

143. All applicable statutes of limitation have also been tolled by Ford's knowing, active, and fraudulent concealment, and denial of the facts alleged herein throughout the time period relevant to this action.

144. Instead of disclosing the defective nature of the CP4 fuel pumps to Plaintiff and consumers, Ford falsely represented that the CP4 pump failure in Plaintiff's Affected Vehicle was caused by Plaintiff's conduct or by the use of contaminated fuel; however, Plaintiff has no way of knowing the quality of the diesel fuel he put in his Affected Vehicle, and regardless, Plaintiff has never—and *would* never—knowingly fill his Affected Vehicle with "contaminated fuel."

145. In reality, Ford's conduct in designing, manufacturing, marketing, selling or repairing Plaintiff's Affected Vehicle for use with American diesel fuel, with which Ford knew Plaintiff's Affected Vehicle was incompatible, causes the "fuel contamination" that ultimately leads to CP4 pump failure.

146. Ford, with the purpose and intent of inducing Plaintiff to refrain from filing suit, pursuing warranty remedies, or taking other action with respect to Ford's conduct, fraudulently concealed the true cause of CP4 pump failure by blaming Plaintiff, and/or contaminated fuel when Ford, even before the design, manufacture, sale or repair of Plaintiff's Affected Vehicle, knew that the defective nature of the Bosch CP4 Pump would and has caused fuel contamination and resulting CP4 pump failure.

147. Ford was under a continuous duty to disclose to Plaintiff the true character, quality and nature of the durability and performance of Plaintiff's Affected Vehicle, the ongoing process of fuel contamination, CP4 pump failure, and the true cause of CP4 pump failure. Instead, Ford knowingly, affirmatively, and actively concealed or recklessly disregarded the foregoing facts. As a result, Ford is estopped from relying on any statutes of limitation or repose as a defense in this action.

148. Any statute of limitations has also been tolled by virtue of a Texas-wide class action, based on same or substantially similar CP4 fuel pump-based allegations, styled *Stevens, et al. v. Ford Motor Co.*, No. 2:18-cv-00456 (S.D. Tex.).

149. For the foregoing reasons, all applicable statutes of limitation have been tolled by operation of the discovery rule and by Ford's fraudulent concealment with respect to all claims against Ford, and Ford is estopped from asserting any such defenses in this action.

VI. CAUSES OF ACTION

COUNT I
FRAUDULENT CONCEALMENT
(Common Law)

150. Plaintiff incorporates by reference all other paragraphs in this Petition as if fully set forth herein.

151. As set forth above, Plaintiff has suffered from a defect that existed in Plaintiff's Affected Vehicle at the time of purchase and which began damaging the Affected Vehicle and its fuel delivery systems upon first use.

152. Ford intentionally concealed and suppressed material facts concerning the durability, performance, fuel efficiency, and quality of Plaintiff's Affected Vehicle, and facts concerning the fragility of the design of the CP4 high-pressure fuel pump in Plaintiff's Affected Vehicle as well as its incompatibility with American diesel fuel, in order to defraud and mislead Plaintiff about the true nature of Plaintiff's Affected Vehicle and reap the financial benefits of that deception.

153. Ford knew that there was a significant uptick in the number of high-pressure fuel pump failures from the moment it introduced the CP4 fuel pump into certain of its diesel vehicle models beginning in the 2011 model year and including 2020 model year, but it did not disclose this information to Plaintiff.

154. Defendant Ford knew the CP4 fuel pump was defective, incompatible with U.S. diesel fuel and intentionally denied warranty coverage for the CP4 failure repair of Plaintiff's Affected Vehicle. Plaintiff presented his Affected Vehicle at a Ford-authorized dealership with approximately 23,000 miles and well under five years at the time he had a CP4 failure. Ford still refused to cover the cost of the repair of the Affected Vehicle under warranty.

155. Ford had knowledge by at least 2002[83] that its diesel fuel injection systems were particularly incompatible with American diesel fuel specifications.

156. As alleged above, prior to the design, manufacture and sale of Plaintiff's Affected Vehicle, Ford knew that the Bosch CP4 Pumps were expected to quickly and catastrophically fail and that such failure would result in contamination of the fuel system components and require repair and replacement of those components, the repairs or replacements of which Ford would refuse to cover under its warranties.

157. Despite this knowledge, Ford marketed Plaintiff's Affected Vehicle in advertising and other forms of communication, including the standard and uniform material provided with Plaintiff's Affected Vehicle, touting the increased durability, fuel economy and performance and that Plaintiff's Affected Vehicle had no significant defects and was compatible with U.S. diesel fuel. Marketing and advertising materials of Ford asserted that Plaintiff's Affected Vehicle would be "delivering up to 20% improvement in fuel economy over the previous generation making it best-in-class." Ford promoted its 6.7L Power Stroke engines as "best-in-class horsepower, torque and fuel economy" and the ability of the Affected Vehicle to run on B20 biodiesel.

[83] *See supra* ¶ 8.

158. The foregoing omitted facts and representations were material because they directly impacted the value of Plaintiff's Affected Vehicle purchased, because those facts directly impacted the decision regarding whether or not Plaintiff would purchase a 2020 F-350 diesel, and because they induced and were intended to induce Plaintiff to purchase a 2020 F-350. Longevity, durability, performance, safety, and compatibility with U.S. diesel fuel are material concerns to Plaintiff. Ford represented to Plaintiff that he was purchasing a 2020 F-350 that was compatible with U.S. diesel fuel, when in fact the combination of U.S. diesel fuel with the CP4 fuel pump creates a ticking time-bomb, wherein pump disintegration begins at the first fill of the tank. Plaintiff did not know of the CP4 fuel pump defect and could not have discovered it through reasonably diligent investigation.

159. Due to its specific and superior knowledge that the Bosch CP4 Pumps in the 2020 F-350 diesel will fail, and due to its false representations regarding the increased durability and fuel efficiency, and due to its incomplete and inadequate disclosure of the defect, Ford had a duty to disclose to Plaintiff that the F-350 diesel was incompatible with the use of U.S. diesel fuel and the consequences of that incompatibility, that the Bosch CP4 Pumps will fail, that Plaintiff's 2020 F-350 Diesel does not have the expected durability over other diesel vehicles or of their namesake predecessor engines, that catastrophic failure of the Bosch CP4 Pump will

damage the engine and engine system, and that Plaintiff would be required to bear the cost of the damage.

160. As alleged above, Ford made specific disclosures and misrepresentations to Plaintiff through the marketing and advertising materials used nationally, and also specifically at Ford-authorized dealerships, during the timeframe prior to the Plaintiff purchasing the Affected Vehicle. Ford had a duty to disclose the truth about the CP4 fuel pump defect because: (1) Ford made disclosures about the Affected Vehicle; (2) Ford made representations that were misleading or untrue; and (3) Ford made a partial disclosure that conveyed a false impression about the Affected Vehicle.

161. Ford knew that Plaintiff would and did reasonably rely upon Ford's false representations and omissions. Plaintiff had no way of knowing that Ford's representations and omissions were false and misleading, that an internal component of the Affected Vehicle is devastatingly defective to the entire fuel and engine system, that the Affected Vehicle was incompatible with the fuel Ford knew would be used to operate Plaintiff's Affected Vehicles, that the normal and intended use of the Affected Vehicle will cause the Affected Vehicle to fail, or that Ford would refuse to repair, replace or compensate Plaintiff for the failure of the Bosch CP4 Pumps and the known consequences of that failure to the Affected Vehicle's engine and entire fuel system.

162. Ford knew that Plaintiff could not have known that Plaintiff's Affected Vehicle will fail when used as intended by Ford.

163. Ford falsely represented the durability, quality and nature of Plaintiff's Affected Vehicle and omitted material facts regarding the lack of durability of Plaintiff's Affected Vehicle, the incompatibility of the Affected Vehicle with the fuel intended by Ford to be used in the Affected Vehicle, and the consequences of that incompatibility, for the purpose of inducing Plaintiff to purchase Affected Vehicle, and to increase Ford's revenue and profits.

164. Ford's scheme to design, manufacture, market and sell Plaintiff's Affected Vehicle with defective CP4 pumps, knowing that U.S. diesel fuel that was certain to be used in Plaintiff's Affected Vehicle and the consequence of using U.S. diesel fuel, then concealing its fraudulent scheme from the public and Plaintiff, reveals a corporate culture that emphasized sales and profits over integrity and an intent to deceive Plaintiff regarding the durability and performance of Plaintiff's Affected Vehicle and its fuel delivery systems.

165. Had Plaintiff known that the Affected Vehicle did not have increased durability over other diesel vehicles, the Affected Vehicle was incompatible with the fuel intended by Plaintiff and Ford to be used in the Affected Vehicle, or that the Affected Vehicle will fail when used as intended, Plaintiff would not have purchased

an Affected Vehicle, or would have paid substantially less for his Affected Vehicle than paid based on Ford's false representations and omissions.

166. Because of Ford's false representations and omissions, Plaintiff has sustained damages because he owns a vehicle that is diminished in value. He did not receive the benefit-of-the-bargain as a result of Ford's concealment of the true nature and quality of Plaintiff's Affected Vehicle.

167. Ford's failure to disclose the heightened incompatibility of Plaintiff's Affected Vehicle with U.S. diesel fuel was intended to cause and did cause Plaintiff to operate his Affected Vehicle with U.S. fuel; and, as a result, Plaintiff has been harmed resulting in damages including but not limited to the decrease in fuel economy caused by the progressive CP4 failure, the cost of repair or replacement of the CP4 fuel pump, the cost of damage caused to his Affected Vehicle by a catastrophic failure of the CP4 fuel pump, loss of use of his Affected Vehicle, diminished value of the Affected Vehicle, loss of earnings, benefit-of-the-bargain, the purchase price of the vehicle, and other damages.

168. Ford still has not made full and adequate disclosures, and continues to defraud Plaintiff by concealing material information regarding the incompatibility of the Affected Vehicle with U.S. diesel fuel and the defective fragility of the CP4 fuel pump therein.

169. Accordingly, Ford is liable to Plaintiff for damages in an amount to be proved at trial.

170. Ford's acts were done wantonly, maliciously, oppressively, deliberately, with intent to defraud, and in reckless disregard of Plaintiff's rights and the representations and omissions made by Ford to Plaintiff were made in order to enrich Ford. Ford's conduct warrants an assessment of punitive damages in an amount sufficient to deter such conduct in the future, the amount of which is to be determined by a jury, according to proof.

COUNT II
VIOLATIONS OF THE TEXAS DECEPTIVE TRADE PRACTICES-CONSUMER PROTECTION ACT ("DTPA")
(Tex. Bus. & Com. Code §§ 17.41, *et seq.*)

171. Plaintiff incorporates by reference all other paragraphs of this Complaint as if fully set forth herein.

172. Plaintiff asserts a claim under the Texas Deceptive Trade Practices-Consumer Protection Act ("DTPA"), which makes it unlawful to commit "[f]alse, misleading, or deceptive acts or practices in the conduct of any trade or commerce." Tex. Bus. & Com. Code § 17.46.

173. Plaintiff is a "consumer" within the meaning of Tex. Bus. & Com. Code § 17.46(4).

174. Ford engaged in "trade or commerce" within the meaning of the DTPA.

175. The DTPA prohibits "false, misleading, or deceptive acts or services in the conduct of any trade or commerce[.]" Tex. Bus. & Com. Code § 17.46(a). By its acts, omissions, failures, and conduct that are described in this Petition, Ford has violated Tex. Bus. & Com. Code § 17.46(b)(1), (2), (5), (7), (9), (12) (13), (20), and (24).

176. Ford participated in unfair and deceptive trade practices that violated the Texas DTPA as described herein. In the course of its business, Ford knowingly concealed and suppressed material facts concerning the defective CP4 fuel pump in the Affected Vehicle. Ford falsely represented the quality of the Affected Vehicle and omitted material facts regarding the incompatibility of the Affected Vehicle with the fuel intended to be used with said vehicle (and the consequences of said incompatibility), as well as the durability and overall value of the Affected Vehicle, for the purpose of increasing Ford's revenue and profits.

177. Specifically, by misrepresenting Plaintiff's Affected Vehicle as safe, durable, reliable, and compatible with U.S. diesel, and by failing to disclose and actively concealing the CP4 fuel pump defect, Ford engaged in deceptive business practices prohibited by the Texas DTPA, including:

a. Knowingly making a false representation as to the characteristics, uses, and benefits of the Affected Vehicle;

b. Knowingly making a false representation as to whether the Affected Vehicle is of a particular standard, quality, or grade;

c. Advertising the Affected Vehicle with the intent not to sell them as advertised; and

d. Engaging in unconscionable, false, or deceptive act or practice in connection with the sale of the Affected Vehicle.

178. Ford's unfair or deceptive acts or practices, including the above-mentioned concealments, omissions, and suppressions of material facts were likely to and did in fact deceive a reasonable Plaintiff about the true safety and reliability of the Affected Vehicle, the quality of Ford's Power-Stroke diesel-engine vehicles, and the true value of the Affected Vehicle.

179. As alleged above, Ford intentionally and knowingly misrepresented facts regarding the Affected Vehicle and the defective high-pressure fuel pumps installed therein with an intent to mislead Plaintiff.

180. Ford knew or should have known that its conduct violated the Texas DTPA.

181. To protect its profits, Ford concealed the CP4 fuel pump defect and continued to allow unsuspecting Plaintiff to continue to buy and drive the inherently defective Affected Vehicle.

182. Ford's misrepresentations violate subdivisions (b)(5) and (b)(24) of the DTPA in that they constitute representations that particular goods and services have certain qualities, uses or benefits when they did not and failing to disclose information about goods or services with the intent to induce Plaintiff to enter into transactions that he would not have entered into had the information been disclosed.

183. Ford owed Plaintiff a duty to disclose the truth about the quality, reliability, durability, and safety of the Affected Vehicle because Ford:

a. Possessed exclusive knowledge of the CP4 fuel pump defect in its Power-Stroke diesel-engine vehicles;

b. Intentionally concealed the foregoing from Plaintiff; and

c. Made incomplete representations about the quality, reliability, durability, and safety of the Affected Vehicle, while purposefully withholding material facts from Plaintiff that contradicted these representations.

184. Because Ford fraudulently concealed the CP4 fuel pump defect in the Affected Vehicle, and failed to disclose to Plaintiff at the time of purchase and repairs that said Affected Vehicle is prone to catastrophic high-pressure fuel pump failure which (1) causes the Affected Vehicle to stall while in motion with a subsequent inability to restart; and (2) results in a comprehensive high-pressure fuel injection system repair/replacement process costing $8,000 - $12,000 that Ford will

not cover, the Affected Vehicle is worth significantly less than the amounts paid by Plaintiff at the time of purchase. Indeed, Plaintiff would not have purchased said vehicle, or would have paid significantly less for it, had he known of the existence of this defect prior to purchase.

185. Plaintiff suffered ascertainable loss caused by Ford's misrepresentations and its failure to disclose material information. Plaintiff did not receive the benefit of his bargain as a result of Ford's misconduct.

186. As a direct and proximate result of Ford's violations of the Texas DTPA, Plaintiff has suffered injury-in-fact and/or actual damages.

187. Plaintiff seeks monetary relief against Ford pursuant to Tex. Bus. & Com. Code §§ 14.41, *et seq.* Plaintiff also seeks an order enjoining Ford's unfair, unlawful, and/or deceptive practices, attorneys' fees, and mental anguish damages and additional damages up to three times the amount of economic damages as permitted by the DTPA.

188. On or around October 21, 2022, Plaintiff made a demand to Ford in satisfaction of Tex. Bus. & Com. Code § 17.505(a); to date, Ford has declined to satisfy Plaintiff's demand. Sixty (60) days have elapsed since the demand was made without an adequate claim resolution proposal by Ford. Plaintiff has met all necessary conditions precedent within the required statutory notice period.

COUNT III
UNJUST ENRICHMENT

189. Plaintiff incorporates by reference all other paragraphs of this Complaint as though fully set forth herein.

190. Ford has received and retained a benefit from the Plaintiff, and inequity has resulted.

191. Ford benefitted from selling and repairing Plaintiff's Affected Vehicle, for more than it was worth as a result of Ford's actions, at a profit, and Plaintiff has overpaid for the Affected Vehicle and been forced to pay other costs, including the repair costs, twice.

192. Thus, Plaintiff conferred a benefit on Ford.

193. It is inequitable for Ford to retain these benefits.

194. Plaintiff was not aware of the true facts about the Affected Vehicle and the CP4 fuel pump prior to purchase or ineffective repairs, and did not benefit from Ford's conduct.

195. Ford knowingly accepted the benefits of their unjust conduct. And, as a result of Ford's conduct, the amount of their unjust enrichment should be determined in an amount according to proof.

COUNT IV
BREACH OF IMPLIED WARRANTY OF MERCHANTABILITY
(Tex. Bus. & Com. Code §§ 2.314 and 2A.212)

196. Plaintiff incorporates by reference all other paragraphs of this Complaint as if fully set forth herein.

197. Ford was at all times a "merchant" with respect to motor vehicles under Tex. Bus. & Com. Code § 2.104(1) and 2A.103(a)(2), and "seller" of motor vehicles under § 2.103(a)(4).

198. Plaintiff's Affected Vehicle is and was at all relevant times "goods" within the meaning of Tex. Bus. & Com. Code. §§ 2.105(a) and 2A.103(a)(16).

199. A warranty that the Affected Vehicle was in merchantable condition and fit for the ordinary purpose for which the vehicles are used is implied by law, pursuant to Tex. Bus. & Com. Code §§ 2.314 and 2A.212.

200. The Affected Vehicle, when sold and at all times thereafter, was not in merchantable condition and is not fit for the ordinary purpose for which vehicles are used.

201. The Bosch CP4 fuel pump in the Affected Vehicle is inherently defective in that it is incompatible with U.S. diesel fuel such that the normal use of the Affected Vehicle causes metal shards to wear off of the pump and disperse throughout the Affected Vehicle's fuel injection system, leading to catastrophic engine failure (oftentimes while the vehicle is in motion, causing a moving stall and subsequent inability to restart the vehicle), thereby causing an increased likelihood of serious injury or death.

202. Ford was provided notice of these issues by numerous consumer complaints, its internal documents, internal investigations, and by communications from Plaintiff.

203. As a direct and proximate result of Ford's breach of the implied warranty of merchantability, Plaintiff has been damaged in an amount to be proven at trial.

VII. EXEMPLARY DAMAGES

204. In addition to the damages demanded above, Plaintiff seeks exemplary damages against Defendant Ford.

205. The conduct of Ford was more than momentary thoughtlessness, inadvertence, or error of judgment and was of such a character as to make Ford guilty of fraud and malice. Ford's acts or omissions involved actual fraud as described herein. Therefore, Plaintiff sues for the maximum amount of exemplary damages, pursuant to Texas Civil Practice and Remedies Code § 41.003, in the amount determined by the trier of fact.

VIII. PRAYER FOR RELIEF

206. WHEREFORE, Plaintiff respectfully requests that the Court enter judgment in his favor and against Ford as follows:

a. An order temporarily and permanently enjoining Ford from continuing unlawful, deceptive, fraudulent, and unfair business practices alleged in this Complaint;

b. Injunctive relief in the form of a recall, free replacement, or buy-back program;

c. Restitution, including recovery of the purchase price of the Affected Vehicle, or the overpayment or diminution in value of his Affected Vehicle;

d. An order requiring Ford to pay both pre- and post-judgment interest on any amounts awarded;

e. CP4 repair costs, including consequential damages;

f. Damages, including costs, exemplary damages, and treble damages, and disgorgement in an amount to be determined at trial;

g. An award of costs and attorneys' fees; and

h. Such other or further relief as may be appropriate.

IX. DEMAND FOR JURY TRIAL

207. Plaintiff hereby demands a jury trial for all claims so triable.

Dated: July 20, 2023

Respectfully submitted,

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